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THE

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CONTAINING

DIRECTIONS

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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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☞ **Please read the Appendix (Pages li. and lii.) in using this Book.**

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PREFACE TO THE 18TH EDITION.

THE editor is indebted to Professor A. D. Bache, Superintendent U. S. Coast Survey, for the article on the Tides of the Coast of the United States, besides many other favors; and to the officers of the U. S. Coast Survey, and U. S. Navy, he tenders his thanks for many obligations.

The subscriber is under obligations to Commander T. A. Jenkins, U. S. Navy, Secretary of the Light-house Board, for information of the changes which are to be made in the light-houses now erected, and of the new light-houses which are to be erected.

Since the publication of the 17th edition, the scientific community has sustained a great loss, by the death of Wm. C. Redfield, Esq., one of the most valuable contributors to this work: he has left a name identified with usefulness, science and goodness.

The information heretofore so freely furnished by the English Admiralty, through Sir Francis Beaufort, the late hydrographer, has been continued through its present hydrographer, Captain John Washington, R. N.

The Coast Pilot is now in the sixty-first year of its existence, and the subscriber hopes gives evidence of improvement commensurate with that advanced age.

GEO. W. BLUNT.

September 1, 1857.

NEW NAUTICAL PUBLICATIONS

OF

E. & G. W. BLUNT.

BOOKS.

Nautical Almanac, containing the Moon's right ascension and declination for every 5 hours.
Bowditch's Navigator, 27th edition.
Blunt's Coast Pilot, 18th edition.
Expeditious Measurer, for measuring cargo.
Ward's Lunar Tables.
Sheet Anchor, 112 quarto plates, with additions by G. W. Blunt.
Commercial Digest, by Joseph Blunt, 9th edition.
TIDE TABLES for the Coast of the United States, by A. D. Bache, Superintendent U. S. Coast Survey.

CHARTS.

Chart from Cape Cod to Labrador, including the Grand Bank and Gulf of Newfoundland, &c.
Eastern Coast of the United States, including Nova Scotia, from New York to Cape Canso.
Long Island Sound, on a large scale.
Chart from Montauk Point to Cape Antonio, including Bahama Bank, &c., on a diagonal scale.
Chart from New York to St. Augustine, in three sheets.
Bahama Banks, including the Admiralty Surveys up to the present date.
Bahama Bank, very large scale, (Pilotage Chart.)
Bahama Banks, Island of Cuba and Passages, on a large scale.
Florida Reef, on a large scale.
North Coast of the Gulf of Mexico, from St. Mark's to New Orleans.
Chart of the Coast of Texas.
West Indies to 15° North, including Gulf of Mexico, with Admiralty Surveys to present date.
West Indies to 9° North, including Gulf of Mexico, Spanish Main, Island of Trinidad, &c., two sheets.
Chart of Guyana, from recent surveys.
Coast of Brazil, three sheets.
River Plate.
Cape de Verde Islands.
NORTH ATLANTIC, new Chart, on a large scale, with a Memoir, PLANS of AZORES, MADEIRA, and TENERIFFE.
North Atlantic, with the curves of magnetic variation, and a Memoir.
South Atlantic.
Do. do. and South Pacific.
North Pacific, including China Seas and all the recent surveys.
Behring's Straits and Sea.
Indian and part of the Pacific Oceans.
Charts of the VINEYARD and NANTUCKET SOUNDS, on a very large scale, from actual surveys.

The subscribers have now published Charts of all the navigable world, from the best authorities, and hope that American Ship-masters will use American Charts.

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Hog Island	W. point of the island, Va.	"	324
Cape Charles	N.E. end of Smith's Island, Va.	Revolving	325
Cape Henry	S. side entrance to Chesapeake Bay, Va.	Fixed	325
Old Point Comfort	N. side entrance to Hampton Roads, Va.	"	326
James River	Virginia.	4 "	328
New Point Comfort	N. side entrance to Mobjack Bay, Va.	"	328
Back River Point	On the point, Chesapeake Bay, Va.	Revolving	328
Pungoteague Creek	Chesapeake Bay	Fixed	329
Smith's Point	S. side entrance to Potomac R., Chesapeake Bay	Fixed	329
Point Lookout	N. side, entrance to Potomac R., Chesapeake Bay	"	330
Fog Point	On Smith's Island, opposite Potomac River	"	332
Clay Island	Mouth of Nanticoke River	"	332
Little Watts Island	E. side Tangier Sound, Chesapeake Bay	"	333
Piney Point	E. side Potomac River	"	334
Blackstone's Island	Entrance to Clement's Bay	"	334
Jones' Point	Near Alexandria, Va.	"	334
Cove Point	North of entrance to Patuxent River	F.V.F.	336
Sharp's Island	Entrance to Choptank River, Md.	Fixed	336
Thomas Point	S. of entrance to Annapolis River	"	337
Greenbury Point	N. side of entrance to Annapolis River	"	337
North Point	N. side of entrance to Patapsco River	2 "	339
Fort Carroll	On the fort, entrance to Patapsco River	"	339
Lazaretto Point	N. side of Baltimore Harbor, Md.	"	339
Point Concord	Mouth of the Susquehanna River	"	341
Poole Island	Mouth of Gunpowder River, Chesapeake Bay	"	341
Turkey Point	At the head of Chesapeake Bay	"	341
Donoho's Battery	Mouth of the Susquehanna River	"	341
Cape Hatteras	On the Cape	Flashing	341
Body's Island	Thirty-two miles N. of Cape Hatteras	F.V.F.	341
Ocracoke Inlet	Near the entrance	Fixed	343
S. side Pamlico R.	On Pamlico Point, N. C.	"	343
Albemarle Sound	At Wade's Point, Pasquotank River	"	344
Cape Lookout	On the Cape, N. C.	"	344
Fort Macon	Back of the fort, Beaufort, N. C.	"	345
Ft. Macon beacon	Front of the fort, Beaufort, N. C.	"	345
Cape Fear	On Bald Head, entrance to Cape Fear River	"	346
Federal Point	Entrance to Cape Fear River, N. C.	"	346
Oak Island	Cape Fear River, N. C.	2 "	348
Price's Creek	Cape Fear River, N. C.	2 "	348
Campbell's Island	Cape Fear River, N. C.	Fixed	348
Orton's Point	Cape Fear River, N. C.	"	348
Upper Jetty	Three miles below Wilmington N. C.	2 "	348
Georgetown	On North Island, Pedee River, S. C.	Fixed	348
Cape Roman	On Raccoon Key, S. C.	"	349
Bull's Bay	N. end of Bull's Island, S. C.	"	350
Charleston	On Light-house Island, S. C.	Revolving	350
Fort Pinckney	On the fort, Charleston, S. C.	Fixed, red	350
Fort Sumpter	On the fort, Charleston, S. C.	Fixed	351
Overall beacons	On Sullivan Island, S. C.	2 "	351
Morris Island	Charleston, S. C.	2 "	352
Tybee Island	On the island, entrance to Savannah River, Ga.	Fixed	355
Tybee beacon	On the island, entrance to Savannah River, Ga.	"	355
Cockspur beacon	On a knoll, East end of the island, Ga.	"	355
South Channel bea'n	On the Oyster-beds, Savannah River	" red	355
Fig Island beacon	On the East end of the island, Savannah River	"	355
Darien	On Sapelo Island, Doboy Sound, Georgia	F.V.F.	357

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Wolf Isl'd beacons	N. end of the island, Doboy Sound, Ga.	2 Fixed	358
St. Simon's Sound	On St. Simon's Island, Ga.	Fixed	358
Cumberland Island	South side entrance to St. Andrew's Sound, Ga.	"	358
Amelia Island	South side entrance to St. Mary's River, Ga.	Revolving	359
St. John's River	Mouth of the River, Jacksonville, Fla.	Fixed	360
St. Augustine	North end Anastasia Island, Fla.	F.V.F.	361
Key Biscayno	On Cape Florida,	Fixed	362, 375, 379
Sand Key	On the key, near Key West light-house	F.V.F.	362, 383
Great Isaac	On the island (building)	Revolving	370
Gun Key	Near South point of the island, Bahamas	"	371
Salt Key Bank	On North Elbow Key, Bahamas	Fixed	372
Bush Key	Dry Tortugas, Fla.	"	362, 374
Key West	On Key West Island, Fla.	"	374, 383
Jupiter Inlet	Florida (authorized)	F.V.F.	376
Cape Canaveral	On the Cape, Fla.	Revolving	376
Carysfort Reef	On the Reef, Fla.	Fixed	362, 377
North-west Passage	Key West, Fla.	"	384
Cedar Keys	On Sea-horse Key, Fla.	F.V.F.	386
Egmont Key	Entrance to Tampa Bay, Fla.	Fixed	387
St. Mark's	East side of entrance, Fla.	"	387
Dog Island	East side of the entrance to St. George's Sound	Revolving	388
St. George's Island	On Cape St. George, Fla.	Fixed	388
Pensacola	South side of the bay, Fa.	Revolving	390
Fort M'Crea	(Authorized)	Fixed	390
Mobile Bay	On Mobile Point	Revolving	391
Sand Island	Three miles S.S.W. of Mobile Point, Ala.	Fixed	391
Sand Isl'd beacons	On the island	1 Fixed, 1 Fixed red	391
Mobile P't beacons		1 Fixed, 1 Fixed red	391
Choctaw Point	South of Mobile City, Ala.	Fixed	391
Ship Island	West end of the island, Miss.	"	392
Cat Island	West point of the island, Miss.	"	392
Bayou St. Jean	Five miles North of New Orleans, La.	"	393
Chandeleur Island	North point of the island, La.	"	393
Pass a l'Outre	North side of the Pass, La., Mississippi River	F.V.F.	395
Frank's Island	N.E. Pass, Mississippi River	Fixed	395
S.W. Pass	Entrance to Mississippi River	"	395
South Pass	On Gordon's Island, entrance Miss. River	Revolving	395
Point Au Fer	Entrance to Atchafalaya Bay, La.	Fixed	397
Marsh Island	Entrance to Vermilion Bay, La.	Revolving	398
Galveston	On Bolivar Point, Texas	Fixed	399
Matagorda Island	East end of the island	Revolving	400
Point Isabel	Brazos Santiago, Texas	Fixed	401
Padre Isl'd beacon	Brazos Santiago, Texas	"	401
Sisal	On the Castle	"	404
Vera Cruz, Mexico	On Fort San Juan de Ulloa	Revolving	411
Tampico River	(Proposed)	Fixed	414
Bermuda	South point of the island	Revolving	415
Turk's Island	North point of the island, Bahamas	"	432
Point Maternillos	Nuevitas Harbor, Cuba	"	440
Key Cruz del Padre	On the Key, Cuba coast (proposed)	"	442
Cardenas	On Piedras Key	"	442
Cayo Diana	On the Key	Red and white, fixed	442
Havana	On Moro Castle	Revolving	445
St. Jago de Cuba	100 yards East of the Castle	"	449
Cienfuegos	On Colorado Point	Fixed	454
Batavano	Hoisted on a mast	"	456
Cape Antonio	On the Cape	Revolving	458
St. Domingo	West side of the entrance	Fixed	469
Morant Point	Jamaica	Revolving	496
St. Juan	Porto Rico, on the Moro	"	509
St. Eustatius	On centre of the island	"	526
Bassaterre	On the beach, St. Christopher's Island	Fixed	527
Fort Berkeley	English Harbor, Antigua	3 "	529
Plymouth	On the beach, Montserrat	2 "	532
Terre de Bas	East end of the island	"	534
Fort St. Louis	Fort Royal Bay, Martinique	2 "	538
Point Negro	Fort Royal Bay, on the fort	Red "	538

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Port Castries	2 fixed, on Campion Battery, 1 fixed on wharf		546
Barbadoes	On South point	Revolving	550
Needham Point	Barbadoes	Fixed	551
Scarborough	On Red Point, Tobago	"	552
Port d'Espagne	On the Jetty, Trinidad	Fixed	559
Laguayra	On the pier, Venezuela	"	576
Brava Point	On the point, Tucacos	"	578
Cayo Grande	(Proposed) Roques	"	580
Buen Ayre	On Lacre Point	"	580
Little Curazao Isl'd	On the South side	"	581
St. Anne's Bay	Great Curazao Island	"	581
Point Betin	Santa Marta	"	586
Aspinwall	Navy Bay	"	603
Omoa	On the fort	"	616
Half-moon Key	On the S.E. point of the key	"	620
English Key	S. side of Belize Channel	3 "	620
Mauger Key	N.W. point, Turneff Keys	3 "	620
Bram's Point	(Building,) Surinam	"	624
Berbice	Near Palace of Justice, New Amsterdam, Guyana	"	626
Demerara	On E. side of entrance	"	627
Cayenne	On Infantry Barracks	"	630
Pernambuco	On the reef, Brazil	Revolving	637, 645
Ciara	On Macoripe Point, Brazil	Fixed	638
Maranham	On Mount Itacolomi	Red and white revolving	641
Maranham	On San Marco's fort, Brazil	Fixed	640
Santa Anna Island	On E. part of the Island, Brazil	Revolving	641
Point Atalaia	On the point, Para, Brazil	"	642
Cape St. Antonio	On the Cape	Red and white "	648
Cape Frio	On the summit, Brazil	Revolving	649
Rio Janeiro	On fort Santa Cruz, Brazil	Fixed	654
Mela Island	Santos, Brazil	"	658
Rio Grande	On North point of the entrance, Brazil	Revolving	666
Flores Island	On the island, Buenos Ayres	"	668
Montevideo	On the Mount, W. side of the harbor, Buenos Ayres	"	671
Colonia	On S.W. angle of the Plaza		673

LIGHTS DESCRIBED IN THE APPENDIX.

Miscoe Island	Gulf of St. Lawrence	Fixed light	li
Cape Rozier	Gulf of St. Lawrence	" "	li
Point de Monts	River of St. Lawrence	" "	li
Cascumpeque Harbor	Prince Edward's Island	" "	li
Richmond Harbor	Prince Edward's Island	" "	li
Bedeque Bay	Prince Edward's Island	" "	li
Charlotte Town	Prince Edward's Island	" "	li
Cardigan Bay	Prince Edward's Island	" "	li
Catalina Harbor	Newfoundland	" "	li
Cape Freels	Newfoundland	Rev. light.	li
Isle Madame	Chedabucto Bay	Fixed light	li
Little River	Maine	F.V.F	li
Horton's Point	Long Island	Fixed light	lii
Lloyd's Harbor	Long Island	" "	lii
Cross Ledge	Delaware Bay	" "	lii
Ship John Shoal	Delaware Bay	" "	lii
Jupiter Inlet	Florida	F.V.F	lii
Loggerhead Key	Tortugas	Fixed light	lii

APPENDIX.

CATALINA HARBOR, NEWFOUNDLAND, page 21.—There is a fixed light at Catalina Harbor, 86 feet above the sea.

CAPE FREELS, NEWFOUNDLAND, page 29.—There is a revolving light at Cape Freels, which may be seen at the distance of 22 miles.

POINT DE MONTS.—There is a fixed light at Point De Monts, North side of St. Lawrence River, which may be seen in clear weather about 15 miles.

CAPE ROZIER, page 88.—A lighthouse is being built at Cape Rozier; it will be 135 feet above the sea, and will exhibit a fixed light of the natural color.

MISCOE ISLAND, page 90.—On the N.E. point of this island, there is a fixed red light, 76 feet above the sea. A shoal extends about 3 miles in a N. by E. direction from the light. On other bearings the light may be approached from the Eastward to within a mile from the shore.

BEDEQUE HARBOR, page 106.—There is a fixed light at Bedeque Harbor, Prince Edward's Island.

CHARLOTTETOWN HARBOR, page 110.—There is a fixed light at Charlottetown Harbor, Prince Edward's Island.

CARDIGAN BAY, page 114.—There is also a fixed light at Cardigan Bay, Prince Edward's Island, which may be seen in clear weather about 15 miles.

CASCUMPEQUE HARBOR, page 117.—There is a fixed light at Cascumpeque Harbor, Prince Edward's Island.

RICHMOND'S HARBOR, page 118.—A light-house, exhibiting a fixed light, has been erected at Richmond's Harbor, Prince Edward's Island.

ISLE MADAME, page 135.—There is a fixed light on the Southern part of Isle Madame, Chedabucto Bay.

LITTLE RIVER, page 215.—For "fixed light," read fixed, varied by flashes.

TENNANT'S HARBOR, page 225.—There is a light-house, 66 feet above the sea, situated about 150 feet from the shore, on the S. W. side of the entrance to the above harbor. The light, which is revolving, showing a red flash every 30 seconds, will be exhibited, for the first time, on the evening of the 1st of January, 1858.

PORTLAND HARBOR, page 235.—The following changes have been made, viz:

ALDEN'S ROCK.—An iron bell buoy, painted black, with "Alden's Rock," in white letters, on both sides of the frame, is placed to mark the rock, instead of the spar buoy formerly at that place.

TRUNDY'S REEF.—A nun buoy, painted black, with "T. R. 9," in white letters, on each side, has been moored in the place of the spar buoy formerly there.

SPRING POINT LEDGE.—An iron buoy, painted black, marked "S. P. L. 11," in white letters, on each side, has been moored in the place of the spar buoy formerly there.

STANFORD'S LEDGE.—A nun buoy, painted black, marked "13," in white figures, has been placed, instead of the spar buoy formerly in that place.

The other marks in this harbor remained unchanged.

WEBSTER'S ROCK, Casco Bay, page 235.—A spar buoy, painted black, has been placed about 20 feet N. ½ E. of the above rock, in 3 fathoms water. The following are compass bearings from the buoy, viz.:

Centre of Half-way Rock.....S. ½ W.
Mark Island Monument.....N. by E.

BOONE ISLAND LEDGE, page 239.—A spar barrel buoy, 50 feet long, painted black, and numbered 1, has been placed upon Boone Island Ledge, which is bare at low-tide. The following are compass bearings from the buoy:

Boone Island light-house, W. 2¾ miles.
Agamenticus hills, W. by N.

The buoy is moored in 13 fathoms, hard bottom, and is 100 yards from the shoalest part of the ledge.

EGG ROCK off Nahant, page 252.—The fixed white light at this station has been changed to a fixed red light, in order to remove all danger of vessels mistaking this light for Long Island Head light, when approaching Broad Sound from the North and East.

NANTUCKET HARBOR, page 268.—A stake light, 15 feet high, is placed in range with the Eastern beacon at the cliffs, Nantucket, for crossing the bar at the Eastern marks, in 5 feet water, at low-tide.

In coming in, bring Brant Point light to bear S., and run for it until the stake light is in range with the beacons; run in on this range until the beacon light at the head of the harbor is nearly in range, but open a little to the East of Brant Point light, then run in on this range, gradually opening the beacon more to the East, until it shuts in behind the farm-house, when run S. into the harbor.

HORTON'S POINT, page 293.—A light-house is in course of erection on this point.

LLOYD'S HARBOR, page 293.—A light-house is being erected on the S.E. point of this harbor.

NEW YORK HARBOR, pages 307 to 311.—Princess Bay light will be changed on the 15th of November, 1857, from a fixed white light to a fixed white light varied by a short eclipse and brilliant flash once in every two minutes.

This distinction will prevent the possibility of mistaking this light for any of the range lights in the lower bay. A N.W. ½ W. course, made good, from the light-vessel, will lead to the mid-channel buoy, at the entrance to Gedney's Channel, on the line of Sandy Hook light and Mount Pleasant in range; and a W. by N. course, made good, from this buoy, (running for Princess Bay light,) will lead through the best water in Gedney's Channel, until Point Comfort lights are in range, when proceed as directed for the various channels.

A spar buoy, painted red and black horizontal stripes, has been placed to mark the wreck of the bark Byron, in the main ship-channel, Lower Bay, New York. It lies in 5 fathoms water, on the N.W. side of the wreck, about two-thirds of a mile below the West Bank buoy, No. 11, and 200 yards West of the red nun buoy, No. 10, on the Upper Middle. It may be passed on either side, but best to the Eastward. The Main Ship-chanel range lights will lead clear of it.

CROSS LEDGE, Del. Bay, page 318.—An iron screw pile light-house is being erected at this station.

SHIP JOHN SHOAL, Del. Bay, page 322.—An iron screw pile light-house is now in course of erection upon this shoal.

WINTER QUARTER SHOAL, page 323.—An iron nun buoy, painted red, with "W. Q. S." in white letters, has been placed in 8 fathoms water, E. by S. one-fourth mile from the shoalest part of the above shoal, off Chincoteague Inlet.

Green Run bears from the buoy N.W. ¾ N., 5½ miles.
Cape Chincoteague, W. by S. ¼ S.

REBECCA SHOAL, page 374.—Distance of Rebecca Shoal from Bush Key light: for "174 miles" read 14 miles.

JUPITER INLET, page 376.—The light-house building at this place will exhibit a fixed light, varied by flashes.

LOGGERHEAD KEY, pages 382 and 384.—A light-house, to exhibit a fixed light, is in course of erection on this key.

MARSH ISLAND La., page 398.—The revolving light formerly at this island is discontinued.

BRAZOS ST. JAGO, Texas, page 401.—The fixed light at Point Isabel has been changed to a fixed light varied by flashes. It is 82 feet above the sea, and should be seen in clear weather about 16 miles.

LAGUNA DE TERMINOS, page 407—A light-house will shortly be erected at this place.

APPENDIX—October, 1857.

WEST QUODDY BAY, *page* 213.—There is a wooden beacon on the Lower Middle Ground, below the Narrows, painted red, surmounted by a cask on a spindle painted white.

West Quoddy Head bears.....S.W. 1½ mile distant.
Black Rock bears.....S.E. by E. ¾ E., 1 mile dist.
Beacon on Western Bar bears.....N.N.W. ¼ W.

Give this beacon a berth of 50 yards.

A wooden beacon is also erected at Western Bar, painted black, surmounted by a cask on a spindle painted white. It should be passed 20 yards to the Eastward. The bottom is hard gravel.

Mid-channel (opposite Cranberry Point) bears N. by E. ¾ E., one mile distant. There are no U. S. buoys in these Narrows.

ST. CROIX RIVER, *page* 215.—There is a fixed light, 71 feet above the sea, on Big Island, opposite Robbinston, St. Croix River. The light is on the keeper's dwelling.

The following is a list of the buoys as they are passed in entering St. Croix River:

Frost's Ledge, a black spar buoy, No. 1, in hard bottom, opposite Clam Cove head, Deer Island.

South end of Big Island, a red spar, No. 2, on Half-tide Ledge. May be approached within 30 yards.

North end of Big Island, a spar, No. 3. This buoy is on a point of ledge, and may be approached within 10 yards.

Middle-ground, spar, No. 4, soft muddy bottom. This buoy is about half-way between Chick's Landing and Raven's Head, and may be passed on either side.

Elliott's Flats, spar buoy, No. 5, marks the channel inside the ledge. Rise of tide 27 feet.

Knight's Point, spar buoy, No. 6, on the outer edge of the flats, marks the main channel.

MOOSE-A-BEC LIGHT-HOUSE, *page* 215.—The light revolves once in 30 seconds, instead of 4 minutes, as stated.

The following is a list of buoys as they are passed entering Moose-a-Beck Reach:

A red spar buoy, No. 6, in 6 feet water, on the South end of Moose-a Bec bar, about 50 feet North of a ledge which dries at low water.

A black spar buoy, No. 5, in 15 feet water, about 100 feet South of Fessenden's Ledge, which is just bare at low water.

A black and red striped spar buoy, in 11 feet water, about 50 feet West of Horse Ledge, which is just bare at low tide.

PETIT MANAN, *page* 216.—The light shows a brilliant flash once in 2 minutes. There is a nun boy on Jackson's Ledge, and a spar buoy on South-east Rock.

FOX ISLAND THOROUGHFARE, *page* 223.—A stone beacon is in course of erection on Fiddler's Ledge.

The following is a list of buoys in this passage, as they are passed going Eastward from Penobscot Bay:

On Drunkard's Ledge,.....a black spar buoy, in 18 feet water.
" Dog-fish Ledge,.....a red " " No. 2, in 26 feet water.
" Cross Island Ledge,...a black " " No. 1, in 17 " "
" Lobster Rocks,.....a " " " No. 3, in 18 " "
" Grindstone Rocks, ...a " " " No. 5, in 15 " "
" Iron Point Ledge,.....a red " " No. 4, in 21 " "
" Waterman's Ledge, ...a red and black spar buoy, in 9 " "
" Thomas' Ledge, ...a black spar buoy, No. 7, in 14 " "
" Goose Rock,.....a " " " No. 9, in 15 " "

CASTINE, *page* 224.—There are three stone beacons at this harbor, as follow:

Otter Rock beacon bears from Dice's Head light-house S.E. by E., one-third of a mile; from Long Island, N.E. ¼ N., 10 miles; from Mark Island, N.E. by N., 7 miles. To be left on the port hand entering.

Hosmer's Ledge beacon bears from Otter Rock beacon E. ¼ S., three-quarters of a mile; from centre of the town, S. by W., half a mile; from Dice's Head light-house, E.S.E., one mile. To be left on starboard hand entering.

Middle-ground beacon bears from Hosmer's Ledge beacon N.E. by E., one mile; from centre of the town, E. ½ S., half a mile.

CARVER'S HARBOR, *page* 224.—Bring the light to bear North-east and run for it. Deep water within a ship's length of the rocks. Half a mile from the light you will pass to the Eastward of Dead-man's Ledge, (the Eastern Hurricane Ledge,) dry at low water. One-fourth of a mile South by West from the light lies Heron Neck Ledge, always above water. Pass between the light and the ledge, (a narrow but deep channel,) and you will open Deep Cave on Green's Island—keep on in an Easterly direction, giving the different points of Green's Island a berth of a cable's length. When up with the S.E. point you will be near a dry ledge, one-eighth of a mile from the point—leave it on the starboard hand—Carver's Harbor will then be in sight, and may be known by the houses around the harbor bearing N.E. by N., distant one mile. Give the East point of Green's Island, opposite the first house, a small berth, and run for the harbor, leaving some dry ledges on the starboard hand. Keep nearest the starboard shore at the entrance of the harbor, to avoid some sunken ledges on the opposite side—anchor in the middle of the harbor in 10 feet water, at low-tide—soft bottom—good holding-ground and good anchorage.

HURRICANE SOUND, *page* 224.—Bring Heron Neck light to bear N.E., and run for it; when half a mile from the light, you will pass Dead-man's Ledge, which you will leave on your port hand, and when midway between the ledge and the light you will be in the entrance to Hurricane Sound, which runs in a Northerly direction.

Keep midway between Green's Island on the East, and the islands and ledges on the West side; and when about a mile and a half above the entrance, you will be near a dry rock; pass to the Eastward of it, and anchor when you have room to give the rock a good berth.

There is anchorage all the way up the sound, but the water is deep until you get above the rock.

BLOCK ISLAND LIGHT, *page* 285.—Only one of the lights at this station is now lighted.

HORTON'S POINT, L. ISLAND, *page* 293.—The fixed light at this station will be lighted for the first time on the 15th of the present month (October.) It is 110 feet above the sea.

CHARLESTON, S. C., *page* 350.—There is a fixed light of the natural color on the East end of Charleston battery, which, with the Fort Sumpter beacons, forms a range for entering North Channel. The light is 45 feet above low water, and may be seen 8 miles.

A new beacon has been lighted on Morris Island, 41½ feet West of the old one, which, in range with Charleston light-house, marks the deepest water in main ship-channel. The old beacon has been torn down.

APPENDIX—JANUARY, 1858.

DUTCH ISLAND, p. 287.—There is a fixed light of the natural color on Dutch Island, R. I. It is 56 feet above the sea, and may be seen from the deck of a vessel 14 miles in clear weather.

LLOYD'S HARBOR, p. 292.—A fixed light of the natural color has been placed on the S.E. point of Lloyd's Neck, in Huntington Bay, L. Island Sound. It is 40 feet above the level of the sound.

MONTAUK POINT, p. 305.—Montauk Point light is a first order fixed light, varied by a flash once in every two minutes.

SHINNECOCK BAY, p. 305.—Shinnecock Bay light is a first order fixed light. The light is 164 feet above the level of the sea.

CAPE ROMAIN, p. 349.—Cape Romain is a revolving light, showing a bright flash every minute. The tower is 150 feet high, and is of dark reddish gray brick. The *old* tower still stands.

CHARLESTON, p. 350, is a fixed light, 133 feet above the level of the sea. The tower is 110 feet high, whitewashed.

SAPELO INLET, p. 357.—A fixed beacon-light, 50 feet above the sea, has been placed in front of the main light, on the Southern extremity of Sapelo Island, Ga., intended as a range for crossing the Bar in the best water. To run in, bring the beacon in range with the main light, and keep on that range until the East beacon on Wolf Island bears S.W. by W. ½ W., when steer N.W. by W. ½ W., keeping in not less than 4 fathoms, to the anchorage, abreast of the main light-house.

CARYSFORT REEF, pages 362 and 377.—The light on this reef, which is now fixed, will, on or about the 15th of March, 1858, be changed to a revolving light of the natural color, showing a bright flash once in 30 seconds. It will be 106 feet above the sea, and should be seen in good weather about 18 miles from a ship's deck.

DRY BANK, p. 379.—The light-house building on Sombrero Shoal, off Dry Bank, Florida Reef, will be finished on or about the 15th of March, 1858, and will be lighted simultaneously with the revolving flashing-light on Carysfort Reef. It will be a fixed white light, illuminating the whole horizon, 141 feet above the sea, and should be seen in clear weather 19 miles from a ship's deck.

Mariners are particularly cautioned *not to mistake this light for the one on Carysfort Reef*, which, as stated above, is to be changed from a fixed to a revolving flashing-light.

BARRATARIA, p. 396.—A fixed light of the fourth order has been erected on the isle Grand Terre, the East side of the entrance to Barrataria Bay. The tower is 55 feet high, whitewashed. The light is 60 feet above the level of the sea.

TIMBALLIER, p. 397.—A fixed light of the fourth order has been erected on the West side of the Grand Pass of Timballier. The tower is 55 feet high, whitewashed. The light is 60 feet above the level of the sea.

RIO DE LA PLATA.—The following lights have recently been established in the Rio de la Plata:

A light-vessel off Point Indio, carrying a fixed white light, about 30 feet above the level of the sea, visible from the deck of a ship from 8 to 10 miles in clear weather.

The vessel lies in 3¼ fathoms water, N.E. ¼ N. of Point Indio, at about 8 miles from the land, near the edge of the bank or shelf that extends to that distance off shore, and about 9 miles S.S.W. of the tail or South-eastern extremity of the Ortiz Bank.

A light-vessel off the North end of the Chico Bank, showing a fixed white light, visible from 8 to 10 miles in clear weather. The vessel lies in 5 fathoms water, N. E. ¼ N., 13 miles from Point Atalaya, and about 33 miles N.W. ½ W. from the before-named Point of Indio light-vessel.

A fixed white light is shown from the hulk or guard-ship, that lies in the Outer Road at Buenos Ayres, in 2½ fathoms water, at about 3½ miles E.N.E of the city, and 40 miles W. ½ N. from the above-named Chico light-vessel. It may be seen 7 miles in clear weather.

A light-vessel is shortly to be placed off the North Spit of the English Bank, at a distance of 11 miles S. by E. from Flores revolving light; also a light on the South point of Lobos Island, off Maldonado, near the North entrance of the River Plata.

It is further proposed to place a refuge raft on the English Bank.

Variation 11° E. at Buenos Ayres, and 9° 50′ at Montevideo, in January, 1857.

LAGUNA, p. 407.—At the Indian village, on the West side of the entrance, there is a fixed light 75 feet high.

LAGUAYRA, p. 576.—Bottom line, for 10° 57′ read 10° 37′.

MACAYO, p. 647.—At Macayo there is an intermittent light of two minutes, viz: bright light 70 seconds, eclipse 16 seconds, brilliant 12 seconds, eclipse 22 seconds. It is 208 feet above the level of the sea.

MORRO SAN PAOLO, p. 653.—On the Morro San Paolo there is a revolving light; time of revolution one minute, duration light 15 seconds. It is 276 feet above the level of the sea. The tower is 80 feet high.

RIO JANEIRO, p. 654.—On Point Calhabouco, the harbor of Rio Janeiro, there is a red fixed light.

APPENDIX—March, 1858.

DUTCH ISLAND, p. 287.—There is a fixed light of the natural color on Dutch Island, R. I. It is 56 feet above the sea, and may be seen from the deck of a vessel 14 miles in clear weather.

LLOYD'S HARBOR, p. 292.—A fixed light of the natural color has been placed on the S.E. point of Lloyd's Neck, in Huntington Bay, L. Island Sound. It is 40 feet above the level of the sound.

MONTAUK POINT, p. 305.—Montauk Point light is a first order fixed light, varied by a flash once in every two minutes.

SHINNECOCK BAY, p. 305.—Shinnecock Bay light is a first order fixed light The light is 164 feet above the level of the sea.

CAPE HATTERAS, p. 342.—There is a beacon light, 25 feet high, 500 yards from the point of the cape; the building is *red*.

CAPE ROMAIN, p. 349.—Cape Romain is a revolving light, showing a bright flash every minute. The tower is 150 feet high, and is of dark reddish gray brick. The *old* tower still stands.

CHARLESTON, p. 350, is a fixed light, 133 feet above the level of the sea. The tower is 110 feet high, whitewashed.

SAPELO INLET, p. 357.—A fixed beacon-light, 50 feet above the sea, has been placed in front of the main light, on the Southern extremity of Sapelo Island, Ga., intended as a range for crossing the Bar in the best water. To run in, bring the beacon in range with the main light, and keep on that range until the East beacon on Wolf Island bears S.W. by W. ½ W., when steer N.W. by W. ½ W., keeping in not less than 4 fathoms, to the anchorage, abreast of the main light-house.

CARYSFORT REEF, pages 362 and 377.—The light on this reef, which is now fixed, will, on or about the 15th of March, 1858, be changed to a revolving light of the natural color, showing a bright flash once in 30 seconds. It will be 106 feet above the sea, and should be seen in good weather about 18 miles from a ship's deck.

LOGGERHEAD KEY, p. 374.—On the first of July, 1858, there will be a fixed light on this Key; the tower is 150 feet high, of brick, and of that color; the plane of the light is 152 feet above the level of the sea. Loggerhead Key is the Westernmost of the Tortugas Keys.

DRY BANK, p. 379.—The light-house building on Sombrero Shoal, off Dry Bank, Florida Reef, will be finished on or about the 15th of March, 1858, and will be lighted simultaneously with the revolving flashing-light on Carysfort Reef. It will be a fixed white light, illuminating the whole horizon, 141 feet above the sea, and should be seen in clear weather 19 miles from a ship's deck.

Mariners are particularly cautioned *not to mistake this light for the one on Carysfort Reef*, which, as stated above, is to be changed from a fixed to a revolving flashing-light.

BARRATARIA, p. 396.—A fixed light of the fourth order has been erected on the isle Grand Terre, the East side of the entrance to Barrataria Bay. The tower is 55 feet high, whitewashed. The light is 60 feet above the level of the sea.

TIMBALLIER, p. 397.—A fixed light of the fourth order has been erected on the West side of the Grand Pass of Timballier. The tower is 55 feet high, whitewashed. The light is 60 feet above the level of the sea.

LAGUNA, p. 407.—At the Indian village, on the West side of the entrance, there is a fixed light 75 feet high.

CIENFUEGOS, p. 455.—There have been four buoys placed in this harbor:

1st Buoy, white, in 18 fathoms water, stony bottom, the Point del Diablo bearing S.E. 5° E.; Point la Vigia, S.W., and the Fort N.W. ¼ N. This buoy is one cable's length from the Eastern, and 4 cables' length from the Western coast, and marks the channel.

2d Buoy, white, in 23 fathoms water, stony bottom, Point del Diablo bearing S.E.; Point la Vigia, S.S.E.; and the Fort N.W. This buoy is about one cable's length from the shore on either side, and 5 cables' length from the first buoy.

3d Buoy, red, in 18 fathoms water, stony bottom, Point Paso Caballos bearing E.N.E.; Point la Milpa, N.E.; and the Fort N.N.E. This buoy is one cable'slength from the shore, and 3 cables' length from the second buoy.

4th Buoy, red, in 25 fathoms water, muddy bottom, Key Carena bearing N.; Point La Milpa, N.N.E.; and Point Caleton de las Damas, E.; distant from the shore one mile, and 2 miles from the third buoy.

Vessels can tack between the buoys, as there is a sufficient depth of water, and not the least danger.

A pilot will be in attendance at all times near the first buoy.

LAGUAYRA, p. 576.—Bottom line, for 10° 57′ read 10° 37′.

MACAYO, p. 647.—At Macayo there is an intermittent light of two minutes, viz: bright light 70 seconds, eclipse 16 seconds, brilliant 12 seconds, eclipse 22 seconds. It is 208 feet above the level of the sea.

MORRO SAN PAOLO, p. 653.—On the Morro San Paolo there is a revolving light; time of revolution one minute, duration light 15 seconds. It is 276 feet above the level of the sea. The tower is 80 feet high.

RIO JANEIRO, p. 654.—On Point Calhabouco, the harbor of Rio Janeiro, there is a red fixed light.

RIO DE LA PLATA p. 671.—The following lights have recently been established in the Rio de la Plata:

A light-vessel off Point Indio, carrying a fixed white light, about 30 feet above the level of the sea, visible from the deck of a ship from 8 to 10 miles in clear weather.

The vessel lies in 3¼ fathoms water, N.E. ¼ N. of Point Indio, at about 8 miles from the land, near the edge of the bank or shelf that extends to that distance off shore, and about 9 miles S.S.W. of the tail or South-eastern extremity of the Ortiz Bank.

A light-vessel off the North end of the Chico Bank, showing a fixed white light, visible from 8 to 10 miles in clear weather. The vessel lies in 5 fathoms water, N. E. ¾ N., 13 miles from Point Atalaya, and about 33 miles N.W. ½ W. from the before-named Point of Indio light-vessel.

A fixed white light is shown from the hulk or guard-ship, that lies in the Outer Road at Buenos Ayres, in 2½ fathoms water, at about 3½ miles E.N.E of the city, and 40 miles W. ½ N. from the above-named Chico light-vessel. It may be seen 7 miles in clear weather.

A light-vessel is shortly to be placed off the North Spit of the English Bank, at a distance of 11 miles S. by E. from Flores revolving light; also a light on the South point of Lobos Island, off Maldonado, near the North entrance of the River Plata.

It is further proposed to place a refuge raft on the English Bank.

Variation 11° E. at Buenos Ayres, and 9° 50′ at Montevideo, in January, 1857.

ERRATA—ST. AUGUSTINE, p. 361.—The bar at this place has changed. Bring the light to bear W. by N., and steer W.S.W. is the present course.

PENSACOLA LIGHT, p. 390.—On the first of November, 1858, will be lighted a revolving Fresnel light, showing a bright flash every minute. The tower is 160 feet high, and the plane of the light 210 feet above the surface of the sea.

SAND ISLAND LIGHT, MOBILE BAY, p. 391 is a fixed Fresnel light. The tower is 150 feet high, and the plane of the light is 152 feet above the surface of the sea.

MOBILE POINT LIGHT, p. 391, now a revolving light, will be changed to a fixed light.

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 towards 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 further 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 further 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 occasions 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 inshore, 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

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* 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 dependent 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 rarefaction 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.

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 drives 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 9 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 prevailing 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 the East. In these seas, Dr. 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 considerably even in the same months of the year. [illegible]ave shown, by the annexed table, where the N.E. Trade, according to the proba[illegible]n, 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 2¼ 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.	0½° to 4° N.	2¾° N.	2¼ degrees.
February	2 to 10 —	4 —	0½ to 3 —	1¼ —	3½
March	2 to 8 —	4¾ —	0½ to 2½ —	1¼ —	3½
April	2½ to 9 —	5 —	0 to 2½ —	1¼ —	3¾
May	4 to 10 —	6½ —	0 to 4 —	2½ —	4
June	6½ to 13 —	8½ —	0 to 5 —	3 —	5½
July	8½ to 14 —	11 —	1 to 6 —	3½ —	7½
August	11 to 15 —	13 —	1 to 5 —	3¼ —	9¾
September	9 to 14 —	11½ —	1 to 5 —	3 —	8½
October	7½ to 14 —	10 —	1 to 5 —	3 —	7
November	6 to 11 —	8 —	1 to 5 —	3 —	4¼
December	3 to 7 —	5½ —	1 to 4½ —	3½ —	2¾

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 North-east 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.

This disaster was owing to their being hove to on the wrong tack. We insert the following, as it has met the approval of some of our most experienced ship-masters.

"HEAVING TO."—The recent disasters which have occurred to American ships, such as the Dorchester, Medora, Ambassador, and many others, have caused [illegible]n-quiry, and it has been suggested by experienced men, borne out by the facts [illegible]e disasters may be traced to the "heaving of ships to" on the wrong tack; that [illegible], that vessels bound to the Westward from Europe, instead of "heaving to" with their port tacks on board, in a South-west gale, as is too often the case, should "heave to" on the starboard tack.

It is well known that our heavy Westerly gales, in the winter season, often begin at the South or South-west, and as they increase in intensity, haul round gradually, but oftentimes suddenly, in a squall, to the North-west. Take, then, the case of a ship bound to the Westward, the wind commencing at the South or South-west, the ship on the port tack; the master, anxious to get to the Westward, carries his canvas as long as possible, and continues on that tack until he has his ship under a close-reefed main-topsail, mizen staysail or trysail—in fact, "hove to" on the port tack, the sea making heavy from the South-west, the wind keeps hauling to the Westward, and the ship falls off with it until she lays in the trough of the sea—the sea then having the control over, and breaking with its full force on the broadside, there is no canvas at this

time set that she can ware under with safety—the ship is then disabled, and sometimes founders—the fact is, over anxiety to get to the Westward has kept the ship too long upon this tack.

Now, what is the best course, as a general rule, to be adopted? We think that the rule should be laid down, that when it is blowing so hard as to make it necessary to furl the foresail, or head sails, previous to doing so, the ship should be wore round, and "hove to" on the starboard tack; and as the wind hauls, she comes up heading the sea more and more, until it is on the bow, and of course in the best position to avoid its shock.

Again, often the wind shifts so suddenly in a S.W. gale, that a ship is taken aback by being on the port tack, which is fearful at any time, and particularly so at such a time. Those who have experienced it on a winter's passage from Europe, with a crew worked down with hard weather, and on a dark night, can only imagine what a scene it is.

This cannot occur on being "hove to" on the starboard tack.

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.

On the Winds, as influencing the tracks sailed by Bermuda vessels; and on the advantage which may be derived from sailing on Curved Courses when meeting with progressive Revolving Winds.

In high latitudes the prevailing atmospheric currents, when undisturbed, are Westerly, particularly in the winter season. As storms and gales revolve by a fixed law, and we are able by observation to distinguish revolving gales from steady-blowing winds, voyages may be shortened by taking advantage of them.

The indications of a Progressive Revolving Gale are, a descending barometer with a regularly veering wind, or with the wind changing suddenly to the opposite point.

In the Northern hemisphere storms revolve from right to left.

In the Southern hemisphere storms revolve from left to right.

The indications of a steady-blowing wind, which will not revolve, but blow in a straight-line direction, is a high barometer remaining stationary. When the steady wind blows from either pole, according to the side of the equator, the atmosphere will be both dry and cool. An increase of warmth and atmospheric moisture are indications of the approach of a Progressive Revolving Wind.

Sailing from Bermuda to New York.—The first half of a revolving gale is a fair wind from Bermuda to New York, because in it the wind blows from the *East;* but the last half is a fair wind from New York to Bermuda. During the winter season, most of the gales which pass along the coast of North America are Revolving Gales. Vessels from Bermuda bound to New York, should put to sea when the *North-west* wind, which is the conclusion of a passing gale, is becoming moderate, and the barometer is rising to its usual level. The probability is, more particularly in the winter season, that, after a short calm, the next succeeding wind will be *Easterly*, the first part of a fresh Revolving Wind coming up from the South-west quarter.

A ship at Bermuda bound to New York or the Chesapeake, might sail whilst the wind is still *West*, and blowing hard, provided the barometer indicate that this West wind is owing to a revolving gale, which will veer to the *Northward*. But as the usual track which gales follow in this hemisphere is Northerly and North-easterly, such a ship should be steered to the Southward. As the wind at *West* veers towards *North-west* and *North*, the vessel would come up, and at last make a course to the Westward, ready to take advantage of the East wind, at the setting in of the next revolving gale.

Sailing from New York to Bermuda.—A vessel at New York and bound to Bermuda, [illegible]me when a revolving wind is passing along the North American coast, should n[illegible] in port for the Westerly wind, but sail as soon as the first portion of the gale has passed by, and the North-east wind is veering towards *North*, provided it should not blow too hard. For the *North* wind will veer to the *Westward*, and become every hour fairer for the voyage to Bermuda.

Sailing between Halifax to Bermuda.—A great number of gales pass along the coast of North America, following nearly similar tracks, and in the winter season make the voyages between Bermuda and Halifax very boisterous. These gales, by revolving as extended whirlwinds, give a *Northerly* wind along the shore of the American continent, and a *Southerly* wind on the whirlwind's opposite side far out in the Atlantic. In sailing from Halifax to Bermuda, it is desirable for this reason to keep to the Westward, as affording a better chance of having a wind blowing at *North*, instead of one at *South*; as well as because the current of the Gulf Stream sets vessels to the Eastward.

From Barbadoes to Bermuda.—When vessels coming from Barbadoes or its neighboring West India Islands, sail to Bermuda on a direct course, they sometimes fall to the Eastward of it, and find it very difficult to make Bermuda when Westerly winds

prevail. They should therefore take advantage of the Trade Wind, to make the 68° or 70° of West longitude, before they leave the 25° of latitude.

Sailing from England to Bermuda.—On a ship leaving England for Bermuda, instead of steering a direct course for the destined port, or following the usual practice of seeking for the Trade Winds, it may be found a better course, on the setting in of an *Easterly* wind to steer *West*, and if the wind should veer by the *South*, towards the *West*, to continue on the port tack, until, by changing, the ship could lie its course. If the wind should continue to veer to *North*, as it sometimes does even to the *Eastward of North*, a ship upon the starboard tack might be allowed to come up with her head to the Westward of her direct course. On both tacks she would have sailed on *curved lines*, the object of which would be to carry her to the Westward against the prevailing wind and currents. There is reason for believing that many of the revolving winds of the winter season originate within the tropics: and that ships seeking the steady Trade Winds, even further South than the tropic at that period of the year, will frequently be disappointed. How near to the equator the revolving winds originate, in the winter season, is an important point not yet sufficiently observed. The quickest voyage from England to Bermuda, therefore, may, perhaps, be made by sailing on a course composed of many curved lines, which cannot be previously laid down, but which must he determined by the winds met with on the voyage. This principle of taking advantage of the changes of revolving winds, by sailing on curved lines, is applicable to high latitudes in bothhemispheres, when ships are sailing Westerly.

GOVERNMENT HOUSE, BERMUDA, 21st March, 1846. W. R.

The above, by Colonel Reid, then Governor of Bermuda, exhibits the general character of the winds in both hemispheres, in high latitudes.

"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 9 or 10 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 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 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 tropics—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 is in 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 light winds; and dreadful hurricanes in these months sometimes render the [illegible] tion perilous. From these perils, however, are exempted the Island of Trinid[illegible] 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 Antilles and the coast of Colombia, the general N.E. or Trade Wind regularly prevails; but near the shore the following pecularities are found:

"At the Greater Antilles, the sea-breeze constantly prevails by day, and the land-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 Antilles, 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 N.E., and the weather is clear. In April, May, and June, the

* Hurricanes have sometimes occurred in these regions.—W.C.R.

winds are from E. to S.E. In July, August, and September, there are calms, with tornadoes from S. to 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 Caracas, 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. to 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 2 or 3 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 coasts 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 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.E., or N.E., particularly in August and September: these winds are denominated in the country, 'vientos de cabeza, ó vendevales,' (head-winds, or rainy winds;) they are not strong, nor do they raise the sea; with them, therefore, a vessel may take 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 see 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 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 $30\frac{6}{100}$ inches, nor fall lower than $29\frac{8}{100}$ 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 3 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 or West, the North will be at an end, and the general breeze will, to a certainty, come on at its regular hour; but if it 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 North-east, 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 the 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 the 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 the greatest descent to 29 inches ninety-six one-hundredths. The thermometer in May rises to 87°, and does not fall to 83½°; in December it rises to 80½°, but never falls below 66½°. 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 Antilles; 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 canvas 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 latitude 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 wind blows 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 latitude 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 withinthe 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 are 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 South-east Trade when within 4 or 5 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 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 Lieut. 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 inshore wind as follows: "From Cape St. Augustine, (Southward,) the wind blows, nine 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 Janeiro and the Rio Plata, it becomes a regular land-breeze from evening to 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.

Lieut. 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 North-east. 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 4 to 6 hours.

The late Captain John McBride, of the Royal Navy, kept a regular journal of the winds and weather at the Falkland Islands, from the 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 top-sail 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 3 or 4 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 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 70 or 80 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 high 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 Colobmia, the Gulfs 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 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 anchor, 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 5 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 inshore 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 Corrientes to St. Jago de Cuba. If the sea-breeze, which in Cuba, as well as Jamaica and St. Domingo, (or Hayti,) generally begins about 9 o'clock in the morning, and freshens until noon, should in the evening about sunset 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 heavilyover 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-wind, to those who have been long resident 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 relaxing.

"Between Jamaica and Maracaybo, and in the space between the latter and St. Domingo, I have always observed, that should the Trade Wind at daylight 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."

U. S. S. MISSISSIPPI, *at Sea, Dec.* 31, 1846.

SIR—In compliance with your request, I have the honor to make the following remarks (the results of observations) on the manner in which the barometer is affected by the changes of weather in the Gulf of Mexico, and the indications it gives of such changes. I have kept a memorandum of the barometer since this ship left Boston, in August, 1845. I noted the height of the barometer at 8 A.M., 12 M., 4 P.M., and 8 P.M., and was also observant of the changes of weather that took place.

The general range of the barometer, for fair and pleasant weather, is from $30\frac{10}{100}$ to $30\frac{20}{100}$ inches; although I have often seen extremely unpleasant weather (mist, and what may be termed a double-reefed topsail breeze) when the barometer was at this range, particularly when on the coast of Yucatan; and I have, at such times, observed that the wind would be from the North and Northward and Eastward, whilst, on the Western coast, and at Vera Cruz, the wind was from the Northward and Westward; but previous to this, the barometer had fallen to 30, or even below 30 inches.

It is said that these are unfailing indications of the approach of what is called a "Norther"—those severe gales that prevail in the Gulf from the month of September to April. These indications are, the clearness of the atmosphere, known by the highlands being visible, particularly Mount Orizaba; heavy dews, and the falling of the barometer; but I have often noted the appearance of these indications when the Norther did not succeed. I have also known Northers to take place when not preceded by these indications, particularly when Mount Orizaba has not been visible for many days; but I have never known a Norther to happen without being preceded by a fall of the barometer—and its intensity may be determined by the degree of the change, and its rapidity. If the fall of the barometer be from $\frac{10}{100}$ to $\frac{20}{100}$, in three or four hours, you may look for a change of weather; and if it be during the season for Northers, you may expect one in a few hours: if in the tornado months, you may expect one of them, or a sudden violent squall.

I have also noticed that a change is indicated rather by the *rapidity* than by the *extent* of the fall of the mercury in the barometer. The barometer falls before a Norther, and then rises as it comes on, and continues rising as the intensity of the gale increases. When the barometer again commences falling, it is an indication that the gale is at its greatest height, and that it is about abating.

I have also noticed that the barometer falls when the wind is Southerly, particularly when from the Southward and Eastward, and that it rises when the winds are from the Northward.

I have already noticed that the winds seldom blow from the Northward and Westward

on the coast of Yucatan. During the Northers, vessels bound North, and those at anchor off Tampico, make for the Campeche Banks, where the Northers are not felt, but a moderate N.E. wind prevails.

I would suggest the supposition, that these violent Northers are met by the N.E Trades, which prevent the Northers from blowing home on the Campeche Banks, and render these Banks a safe retreat for vessels in cases of violent Northers.

I am, Sir, with sentiments of respect, your obedient servant,

M. H. BEECHER, *Prof. Math.*

Com. M. C. PERRY, *U. S. S. Mississippi.*

CURSORY REMARKS AND SUGGESTIONS ON VARIOUS TOPICS IN METEOROLOGY.

BY AN AMATEUR OBSERVER.

THE science of Meterology 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 aërial 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 45 or 50 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 30 inches in height. By means of this instrument we learn that one-half its weight or actual quantity is within 3½ miles 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 5 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 50 miles, still, as compared with its entire surface, this is only equal to one five-hundreth 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 18 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 50°.

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 further 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 Guatemala, 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 aeronauts. 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 phenomena 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 a 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 bath 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 hailstones are thrown against each

other and broken; and each successive layer of congelation may be often 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 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 and intermingling of masses of air of different temperatures and hygrometric conditions becomes 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 of 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 cold 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 12 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 a of a temperature considerably above the freezing point, is necessary to the production

hunder and lightning. In the Strait of Magellan in Patagonia, where the air of the urface is neither warm nor yet very cold, the squalls, called by the sailors williwaws, re very frequent, and tremendously severe; but, according to the observations of Capain P. P. King, lightning and thunder are seldom known.

The heavy condensation presented in a thunder-cloud is often spoken of in a manner hich implies that the cloud possesses some mechanical or other energy, by means of hich 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 furnish lso the watery depositions for the hail or rain, but all the particles of the cloud are assively inert, like those of a common fog or mist, and the violent winds and disturbng forces which may be present, operate to produce the cloud, but do not, in any imortant sense, result from its action.

Water-spouts and Whirlwinds.

The character of these meteors has already been described, in a measure, in our acount of hail and thunder storms. The identity of whirlwinds and water-spouts was aintained by Franklin, and although at a later period this has been called in quesion, it appears to have been done without sufficient reason.

From the equal distribution of the atmosphere as the oceanic envelope of our earth, t results that no movement of great violence can take place in any of its parts, except y 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 f an external propelling force, and a constant spiral discharge from that extremity of s axis towards which is the tendency of motion. Both these conditions, it is believed, re fulfilled to the letter in the case of a common whirlwind or water-spout. The air t the upper extremity of the whirling column, owing to its elevation, is rarer than at he base, and the column itself, particularly in its central portions, is mechanically rareied by the centrifugal effect of its own whirling motion. We have thus a sort of rareied chimney into which the denser air at the base of the column is continually forced y the pressure of the surrounding atmosphere; not to ascend in a separate current, as n the common chimney, but entering into the organization of the whirling vortex, to upply 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 he propulsion is maintained, is found in the pressure of the surrounding atmosphere pon all sides of the mechanically rarefied column, and if the expansive whirling motion e sufficiently active to produce nearly a vacuum at the centre, the external propelling orce 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 suffiient to account for all the violence that is ever produced.

Were there no vorticular or whirling action already excited, and no discharge from he upper extremity of the vortex, the external pressure, it is true, could not produce otation; but this movement and upward discharge having once commenced, from any ause, the particles near the exterior of the column, like those of water in a funnel, ield at a little more than a right angle, to the external pressure, in their spirally approximating course towards the rarefied centre. By the slowness of this central approximation as compared with the whirling action, the intensity or magnitude of the xternal pressure becomes merged in the velocity of the rotative action. As the area f the spiral circuit decreases rapidly as we approach the centre, it follows that the veocity of the whirling movement must be proportionably increased, as we perceive it to e in the funnel and in all regular-formed vortices. Thus, if the rotative velocity near he exterior of a column be at the rate of but ten miles an hour, at one-third nearer the entre the velocity must be more than doubled, and at two-thirds of the distance from he first-named point to the centre, the absolute whirling velocity must be increased inefold, which in this case is equal to ninety miles an hour; and in consequence of he reduced diameter of the circuit of gyration, at the last point, the number of revoutions must here be as four hundred, to one of the point first mentioned. The increased scending velocity, however, is not here taken into account, which may perhaps reduce he 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 rarefied 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 a 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 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 parallels 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.

Similar results are found in nearly all the regions which separate the great natural circuit of winds from each other, and these tracks 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 rarefied 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 Aug., 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 3000 miles, which was passed over by the storm in about 6 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 voyages, 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 six 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.

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.

7. 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 *furthest* 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 portion 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 tracks of these and other hurricanes appear on the annexed chart.

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.

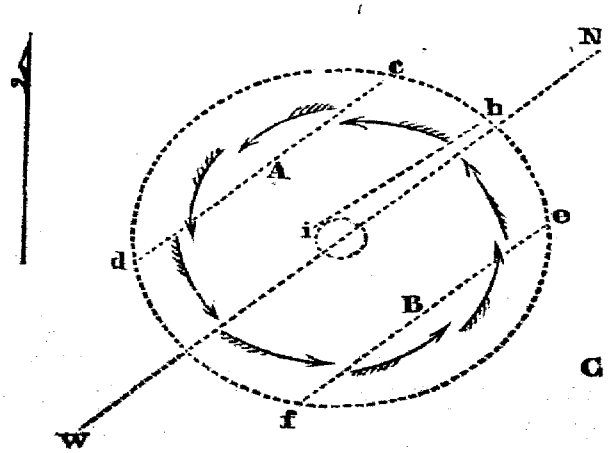
12. Owing to the centrifugal action of these rotative storms, the barometer, whether in the higher or lower latitudes, always sinks while under the first portion or moiety of the storm on every part of its track, excepting, perhaps, its extreme outward margin and commonly affords us the earliest and 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 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 aught 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

* 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.

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 "port 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 a 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 a 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 the North-westward, veering afterwards by West to the Southern 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 27, having moved over the entire route from Trinidad to the Western shore of the Bay of Honduras, in a little more than a 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 2000 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 the 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 3000 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 Maine, on the 9th; being on the highlands of New-Hampshire a violent snow-storm. The destructive action of

* Mr. Purdy states that this gale was felt at Natchez, 300 miles up the Mississippi.
† All distances are expressed in nautical miles.

this storm was widely extended on both sides 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 2200 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 Matamoras, 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 more directly, and further 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 2200 miles in 6 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 7 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 in its way. Its course is quite analogous 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 further 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.

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* 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 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.

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 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.

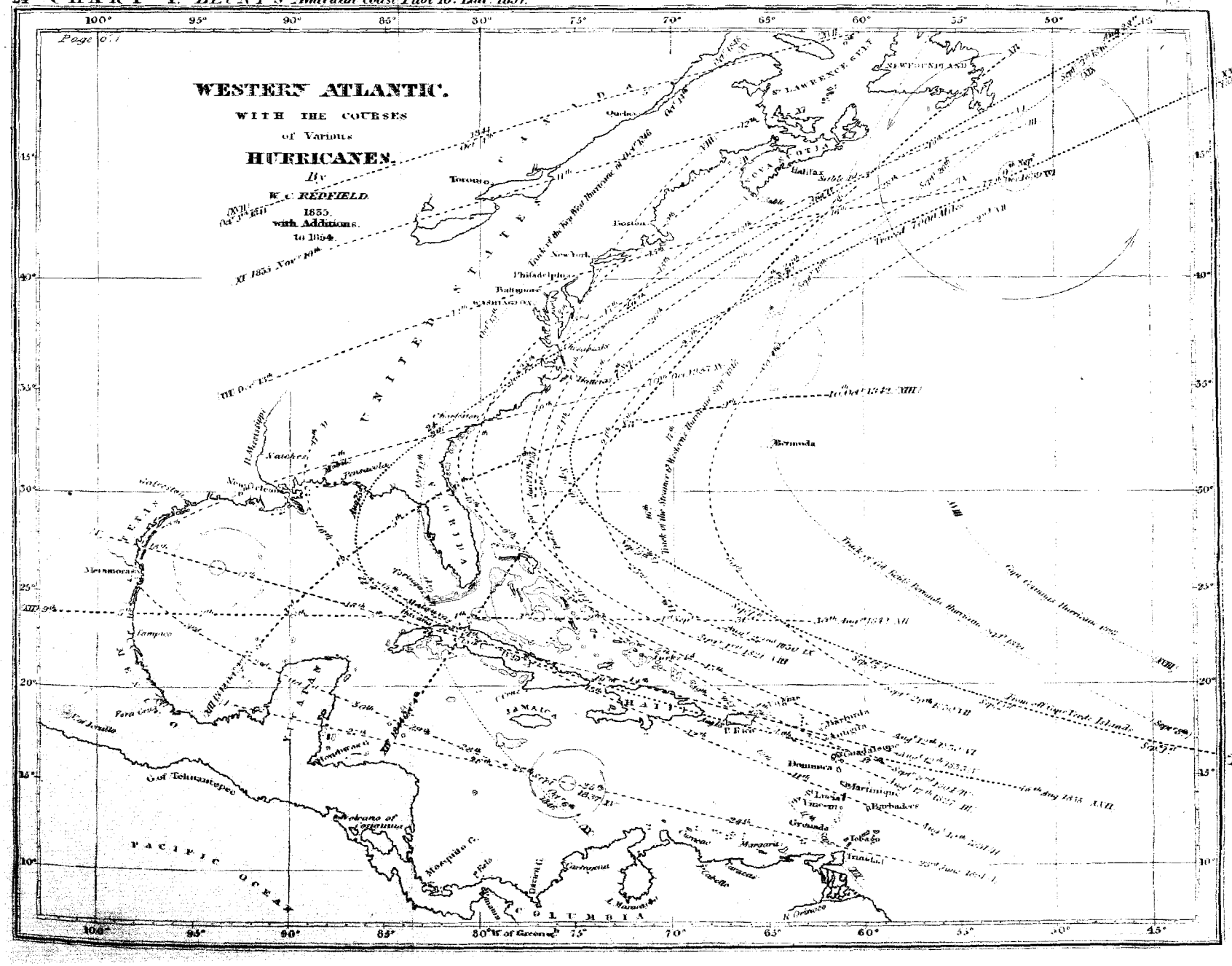
Track No. XI. represents a portion of the general route of the violent inland storm which swept over the Lakes Erie and Ontario, on the 13th of November, 1835. This storm was very extensive, spreading from the sea-coast of Virginia into the Canadas, to a limit at present unknown. The anterior portion 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.

We have thus given a summary description of the route of 12 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 Nos. 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 a 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 hurricanes 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 to 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 apparent course in the higher latitudes, 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


WESTERN ATLANTIC.
WITH THE COURSES
of Various
HURRICANES,
By
W. C. REDFIELD.
1855.
with Additions.
to 1854.
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Toronto
Quebec
Halifax
Boston
New York
Philadelphia
Baltimore
WASHINGTON
Charleston
Savannah
Mobile
New Orleans
Galveston
Matamoras
Tampico
Vera Cruz
Bermuda
JAMAICA
HAYTI
P. Rico
Barbados
Martinique
Grenada
Trinidad
Tobago
Margarita
Caracas
Carthagena
Chiriqui
Panama
Guayaquil
G. of Tehuantepec
PACIFIC OCEAN
COLUMBIA
Mosquito C.
Gulf of Mexico
NEW FOUNDLAND
ST. LAWRENCE GULF
NOVA SCOTIA
Track of the Great Hurricane of Oct. 1846
Track of the Steamer Arctic Sept. 1854
Track of the Steamer Bermuda Sept. 1846
Track of old Irish Bermuda Hurricane Sept. 1835
Cape Verde Hurricane 1857
Track off Cape Verde Islands
Travel 7000 Miles
W. of Greenwich

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 wind 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 stormes 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 cir cuits of wind, of which the Trade Winds form an integral part, are nearly uniform i all the great oceanic basins; and that the *course* of these circuits and of the storm gyrations which they may contain, is in the Southern hemisphere, in a *counter-directio* to those North of the equator, producing a corresponding difference in the genera phases of storms and winds in the two hemispheres.

From the foregoing results we infer the value and importance of correct marine re ports relating to violent gales. Those reports should always comprise the *date*, th *latitude and longitude*, and the *principal direction and changes of the wind.*

CURRENTS.

A Current is at present to be understood as a stream on, or a particular set the direction of, the surface of the sea, occasioned by winds and other impulses, ex clusive of (but which may be influenced by) the causes of the tides. It is an observa tion of Dampier, that currents are scarcely ever felt but at sea, and tides but upon th coasts; and it is certainly an established fact, that currents prevail mostly in thos parts where the tides are weak, and scarcely perceptible, or where the sea, apparentl little influenced by the causes of the tide, is disposed to a quiescent state. This wil be obvious by an attentive consideration of the following descriptions. The necessit of attention to the silent, imperceptible, and therefore dangerous operation of current will be equally apparent.

The currents of the Atlantic are often of a local and temporary nature; yet experi ence has shown where and how they predominate, and reason will inform the marine where he is to expect and allow for their operation.

With the greatest velocity of the equinoctial current we cannot pretend to be accu rately 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 2 or 3 miles.

At any considerable distance from the coast of America, the Easterly current cause 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 th influence of this current. The currents here, though slow, are produced in the direc tion of the wind, particularly when it is of long continuance. These currents are foun stronger near the islands and rocks of Bermudas than at a distance. In a brisk gale, th current here has been experienced from 12 to 18 miles in 24 hours, in the direction o 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 pas sage from Halifax to the English Channel in 16 or 18 days, with such currents as thos which carried the bowsprit of the Little Belt, sloop of war, lost near Halifax, in 1 months, to the entrance of Basque Roads. The currents of the Atlantic have sent t the shores of the Hebrides the products of Jamaica and Cuba, and of the Souther parts of North America.

The Easterly and South-easterly currents are blended in their Southern region with the Florida or Gulf Stream, hereafter described, and they do not seem to prevai to the S.W. of the Azores. On the contrary, to the W.S.W. and S.W. of these islands the currents appear to follow the course of the Trade Winds towards the Caribbea 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 t the Northward of the Bermudas, and even unite with the Southern edge or reflow o the Gulf Stream. The existence of these currents has long been known, but a further examination and more precise information are still desiderata. The recent examples o 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 current 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 cap tain 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 o which he states that he perfectly remembers, though he cannot give the elements, i

nsequence of having lost his journals, that in July, 1795, or 1796, when sailing with fresh breeze from Santa Martha to Jamaica, in a schooner, he steered for Morant oint; but considering that by keeping as close hauled as that course required, he must e unable to make it before the day was spent, he preferred keeping away, to make the nd to leeward of it, and did so at 8 A. M., thus augmenting the rate of the vessel's iling. At noon he observed the latitude, in conjunction with the pilot, Don Miguel atina, and found that they were some minutes to the Northward of Morant Point; nd 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 hat they were three days crossing from Santa Martha to Jamaica.

"On leaving the parallel of the Bago del Comby (15° 30′) the first time that the Spanish surveying vessels went in search of it, and being to leeward of the meridian under hich the charts placed it, by 12 leagues, they made sail so that, at the rate of sailing, ey expected to join the brig Alerta next evening, as they knew she was waiting for em at her anchorage at the Southernmost of the Pedro Keys. At 8 A. M., next day, vessel was seen ahead, which at first they mistook for a rock, but soon made out that was a vessel at anchor; and by 9 A. M. they saw not only the Alerta at anchor, but so the Pedro Key, towards which the current carried them with much strength; and spite of having to make several tacks, in order to fetch the proper channel, they nchored beside the Alerta by mid-day. The commander does not recollect the longide he observed that morning, but remembers that the current had carried them to the orthward. In the next year, when surveying the West end of the Pedro Shoals, they ound the current nearly the same; and this ought to be a warning to navigators not to ake 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° 0′, as was remarked by the brig Alerta, when near its Northern extremity. The same the case on its Southern side; for in prior years, the schooner St. Gregorio, bound rom Carthagena to Trinidad, saw the South end of the shoal at 4 P. M. At 5 she was hree miles from it; but noticing that the current set strongly towards the shoal, they et sail and ran to the South until they considered the vessel nine miles from the Southrn point; and the following morning tacked to sight it, which she did not effect, havng doubtless passed to leeward of it."

"In more than thirty voyages made by Captain Pedrola, from the Spanish Main to orto Rico, St. Domingo, and Cuba, sometimes with chronometers, and others without hem, he remarked that between the last two islands and the coast of the main, sixteen iles 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 trong and continued vigor at certain seasons, particularly in the winter months, and rolls he waves over a great extent of sea, into the great bay Westward of Carthagena, which e have called the Bay of Guatemala. This may cause, at times, an outset, but no contant current is to be found." To this is added, in the Derrotero, "among the original apers possessed by the Deposito Hydrografica, the following observations, by different fficers, have been found, which may tend to throw some light upon the matter:

"In the examination of the coast between Porto Vello (Porto Bello) and the Bocas el Toro, made in 1717, by Don Fabian Abances, he found on that coast, in the month f April, strong currents setting to the E.N.E., at the rate of two miles an hour; so hat, heaving to at night, off Cocle Point, he found himself in the morning up at Chagre. he winds at the time were either calm or squally from the South-westward. Don abian proceeded to the Northward, to the parallel of 10°, and then met with winds rom N. and N.N.E., with which he steered W. and W.N.W., until he considered imself 10 leagues to the West of the Bocas del Toro; but the current had carried im to the E.S.E., so that, when he expected to make the Bocas, he found himself at he point of Miguel de Borda, about 5 leagues to the Westward of Chagre. During he whole time, from leaving Porto Vello, he never gained an observation, the weather eing 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, n 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 Joaquin 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 Barrancas, 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 Antilles, 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 coast 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 the shore. In the Gulf of Paria, also, the tide influences the currents.

"In the Southern straits or channels of the Antilles, 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 Laguayra 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 very 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 $1\frac{1}{2}$ to $2\frac{1}{2}$ 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 Rosario 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 five weeks in which I remained at Carthagena, in June and July, 1817, the current inshore set constantly and strongly to the Northward, at a rate, I am convinced, of not less than $1\frac{1}{2}$ 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 W. 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."

Further 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 remarks 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 W. 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 the 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 two 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 there 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.

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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 Charleston newspaper at Kingston, Jamaica, which stated that the bottle had been picked up on the shore, near St. Mary's, in Florida.

"On the South side of Cuba, when the wind is Westerly, which it often is, you are always certain of a reflowing 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 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 Grenadians, 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-quarters of a mile hourly. Northward of Guadaloupe it sets W. ½ S., and between Montserrat 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 2 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 one to nearly two 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 in-

crease 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 a 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 6½°.

2. On May 20, 1802, the Cuffnels, East Indiaman, lost the N.E. Trade in 8½° 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 33½ 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 2½ 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 Montevideo, 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 currents having set them to the Westward, after the failure of the N.E. Trade Wind. The current runs strongly about this island.

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 32½°, 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 small portion of it winds round Cape Antonio to the 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 further 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 and 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 everything; 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 seamanlike 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 furthest 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 towards 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 2½ to 3½ miles. Between the Bemini Isles and Cape Florida, its direction is about N. by E., and velocity the same.

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 tôo 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 storm, it opposes the stream in its course, and its adverse power causes it to fill all the channels and openings among the 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 2 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

* In the month of September, 1769, there happened an inundation, which covered the tops of the highest trees on the Cayo Largo, &c., and during which the Ludbury 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 his anchor among the trees.—(De Braham's Atlantic Pilot.)

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 lat. 34° 35′, and long. 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 lat. 38°, and long. about 59°, the ship was in the Gulf Stream, setting finally 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."

Currents from the Bay of Honduras, and thence through the Strait of Florida, as observed by Capt. W. J. Capes, in January, 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 Capt. W. J. Monteath.

Between lat. 25° 40′ and 28° 20′, Capt. 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′, Capt. 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°, 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,

* 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."

and to throw it off to the E.N.E. and E. by N. Northerly. In about the parallel of 39½°, long. 63½°, it has been found to run at the rate of 2 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 lat. 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 25 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 further into the ocean, and diminish its strength.* It is clear, then, that the stream fluctuates in its direction and 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 ahead 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, (100 miles 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.

We 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

* 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 degrees of Fahrenheit, and the strongest current to differ from 3 to 1¼ miles per hour; that the breadth of the stream-current is much less than is generally supposed, and that the winds cause 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."

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 Great 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 degrees colder still, or 15 degrees 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, in the winter; 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 further fall of 8 degrees will indicate your being on soundings.

On the coast from Cape Henlopen to Cape Henry, the water out of soundings is 5 degrees warmer than in soundings in the winter; 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 further 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, heavy and continued gales very frequently prevail, which commonly proceed from betweeen 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 South-easterly wind, it has been found that the current is forced close to the shore. This proves the Gulf is 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 proportionally increased. This circumstance has been, in particular, observed from about the longitude of Block Island, along the edges of Nantucket Shoal, 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 W. and N.W. winds, the stream would be removed some leagues further off. These remarks are sufficient to show the uncertainty of the boundaries or edges of the stream. The 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.

Captain Livingston says, "It set me off Cape Hatteras one degree and eight miles,

* 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.

by sidereal and solar observations, to the Northward, in 16 hours, by dead reckoning; and Capt. J. Coltast, of Philadelphia, informed me that it set occasionally with greater volocity."

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 opportunity 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 anything 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 1847; 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, in passing the Nantucket Shoals, to keep between them and the stream.

Ships crossing the stream, when bound to the Westward, must get over as quickly as possible; or it is clear 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 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. & 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

* 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 of Mr J. Williams, it appears that in November, 1789, the water on the coast was 47°, 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.

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."

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° further 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 7 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, may be estimated at the same, from Mons. Godin's observations;† but as the coast

* History of Jamaica, London, 1754, vol. iii. pp. 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.

† Monsieur Godin's experiments upon the pendulum were made at the petit grove. They continued from the 24th of Aug. to the 4th of Sept., 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, pp. 5, 7.) According to M. de Luc's calculation, (see Modifications de l'Atmosphère, vol. i. p. 378,) the 25th

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°,* the small variation of temperature on the surface not being sufficient to affect 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 Howe'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 five 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 further 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 first of October, our latitude was 36° 22′, 38 miles further 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 curious to observe that the heat of the Gulf Stream was 2° less. The seasons of the year, indeed, were very different; 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

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degree of Reaumer's TRUE thermometer answers to about the 85th of Fahrenheit's, but the average heat in Jamaica, during the months of Aug. and Sept., 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 inclosed 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.

power was become very great, yet the winter has 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 knew 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 alledge 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 the loss of 2° of heat to 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 current; 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 track 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, unacquainted 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 breaking of the breakers in constant succession on the reef, till past one o'clock; the storm continued till ten the 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 further 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 precautions 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 deter-

* 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 you 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 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 daylight 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 2 miles without the steep part of it, they will show the proximity of danger."

mining 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 everywhere 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 Turks 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."

Captain 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 of rocks, or white sand. The eddy takes its current in an opposite direction from that of the contiguous stream, viz., South-westerly."

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."*

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* 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, 1820. The ship's place at noon, 23° 4′ N., 79° 50′ W. To the North-eastward, on the next day, without the stream, in lat. 29°

It has been found that inside and outside of the Gulf Stream there is a current setting to the S.S.W., from 18 to 20 miles a day, and that this current is accelerated or diminished by the winds. This current (which is a continuation of the Labrador current) sets, more or less, to the S.S.W., according to the figure of the coast.

Upon Soundings, along the coasts of Georgia, Carolina, Virginia, New Jersey, and New York, the current runs, in general, parallel to the shore. 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 S.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 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 General Character of the Currents near the Coast of the United States, by W. C. Redfield.

It appears from observations found on the pages of the Coast Pilot, 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 usually called *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 exhibits a rotary movement. It also derives its waters 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 the following reasons:

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 Maternillo Bank, and no Northerly current was found; and nearly two degrees further Eastward, in 28° 7′ N., and 76° 53′ W., the current, in 24 hours, had set 3′ S. and 14′ E. The ship was, therefore, evidently in the off-set of 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 30° 36′ E.

Captain 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 September 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 off Sable Island.

The brig afterwards proceeded from Halifax to Jamaica, and on the 22d of November, 1819, in 40° N., 62° West, 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.

1st. Because, in open sea, it nowhere assumes the *form* of an eddy; but, when unobstructed by violent winds, pursues its course towards the South-west, parallel to the general direction of the coast.

2d. Because, on the edge of the Gulf Stream on this coast, there are no obstacles presented which could divert the progress of a portion of the stream, or circumscribe the same in eddies.

3d. Because, if this current was derived from the Gulf Stream, it must necessarily partake of its temperature, as above suggested; 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 hemispheres, 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 sometimes 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 in part imbedded upon a colder current which is setting in the opposite direction, in its progress from the polar regions. The impulses by which these opposite 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 moving in the same manner, and the latter are often known to maintain opposite courses for a long period and at high velocities.

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 determined, in most cases, by means of the thermometer; and with the aid of good chronometers, their position and extent may be ascertained 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 shipmaster 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, 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 this portion of the polar current probably "joins" the Gulf Stream in no other manner than by intruding upon and passing under the same, the order of super-position being determined by the diversity of temperature, or by the deeper position of the polar stream.† The icebergs being thus carried Southward by the deeper polar current, their rapid destruction is here effected by the water of the Gulf Stream, and we are thus relieved from these dangerous obstructions, which would otherwise be found in the lower latitudes of the Atlantic. These two streams of current, therefore, do not 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 West-

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* Nautical Magazine for March, 1837, p. 139. He states that between 42° and 43° West is the furthest Easterly position in which floating masses of ice have been found; but we have shown that they sometimes extend to longitude 39°.

†For an account of the ice of the North Atlantic, see Blunt's Memoir of the Dangers of the North Atlantic.

ward along the shoals and soundings of the American continent, and its contiguous ocean depths, by the slower 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 spite 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 polar current. The South-easterly branch of the warm 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 circuits, 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 the tides and a state of unstable 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 50 or 60 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 more 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 storms and the common drift caused by the prevailing 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.

NOTES ON THE GULF STREAM.

BY A. D. BACHE,

Superintendent of the U. S. Coast Survey.

(*Revised to* 1854, *and communicated by authority of the Treasury Department.*)

THE developments made by the Coast Survey in the summer of 1853, in relation to the Gulf Stream, requiring a revision of the notes to bring them up to date, I have at the request of Mr. Blunt, and by authority of the Treasury Department, embodied the new results with the former ones and communicated them for publication, that navigators may be benefited by the extensive circulation which they will receive in this form.

The Gulf Stream and the approaches to it have been explored in the progress of the survey of the Coast between the limits of a line perpendicularly across it from Cape Cod, to another from Cape Canaveral, the observations generally extending from about 42° N. Latitude to about 28½°, and from about 65½° W. Longitude to 80½°. The observations were made under detailed instructions from the Superintendent, by the following-named Officers of the Navy, Assistants in the Coast Survey:—

By Lieut. Com'g C. H. Davis, who examined in 1845 the Section from Cape Cod, and positions to the southward and westward of it; by Lieut. Com'g Geo. M. Bache, who in 1846 explored the Sections perpendicular to the Stream from Sandy Hook, from Cape May, and from Cape Charles; by Lieut. Com'g S. P. Lee, in 1847, who explored the Cape Charles Section; by Lieut. Com'g Richard Bache, in 1848, who repeated the observations on the Cape Charles Section, and explored the Hatteras Section; by Lieut. Com'g J. N. Maffit, in 1853, who went over the Hatteras observations, and examined the Sections from Cape Fear, and from Charleston; and by Lieut. Com'g T. A. Craven, during the same season, who explored the Charleston, St. Simon's, St. Augustine, and Cape Canaveral Sections, and several other positions towards Cape Florida.

The different sections of the Stream were designed to be perpendicular to its axis from prominent points of the Coast, at such distances from each other as would insure a thorough knowledge of its whole course. It was foreseen that the surface observations would be of comparatively little value, from the varied character of the circumstances to which the surface water is exposed, and the observations were accordingly carried to considerable depths. I propose to give the general distribution of the temperatures shown by the several sections, and to connect with this, remarks on other points developed by the examinations.

1st. The Ocean within the region of the Gulf Stream is divided into several bands of higher and lower temperature, of which the axis of the Gulf Stream is the hottest, the temperature falling rapidly in-shore, and more slowly outside. This is not only the case at the surface, but with modifications, easily understood, at considerable depths. It is represented in the annexed Diagram (No. 1), showing the distribution of temperature on the Sandy Hook Section at the depth of fifteen fathoms, from the observations of Lieut. Geo. M. Bache. The scale of nautical miles on top shows how far the several points are from Sandy Hook. The scale at the side shows what the thermometer, with Fahrenheit's scale, would read if let down fifteen fathoms at the several positions marked at the top. The thermometer say at Position I, 100 miles from Sandy Hook, let down fifteen fathoms would mark 63°; at III, 150 miles would mark 67°; at 240 miles 63½°; and at 280 miles 80½°. When the curve rises, the thermometer would rise, and vice versa. Three points, b, d, and f, decidedly warmer than those on either side of them are seen; the warmest is at the axis of the main Gulf Stream. There are four points of low temperature, lower than those either inside or outside of them. The changes on the Cape May Section are even more strongly marked, the curve of fifteen fathoms being dotted on the same diagram, and including a fourth point of high temperature, h. The curve of one hundred and fifty fathoms on the Cape May Section is added, as showing how boldly these features come out at considerable depths.

The curve of twenty fathoms on the Charleston Section in the Diagram (No. 2), shows the same thing. The curves deduced from the mean of observations at two hundred and three hundred fathoms give a similar result. These cases are mere illustrations of the general fact.

These bands are also shown in the sketch A, where the dark shades correspond to the warm bands, and the light spaces to the cold ones.

2d. Among the cold bands is one so much colder than the rest as to be very remarkable; it is that next inside of the axis of the main stream, and the change of temperature between it and the stream is so abrupt that Lieut. G. M. Bache called the space the "cold wall," the cold water appearing to confine the hot water as by a wall on the in-shore side. The Sandy Hook Diagram (No. 1), shows it between 230 and 280 miles from the shore, the Cape May between 132 and 178 miles from the shore; the rise in the first curve is from 62½° to 80½°, eighteen degrees in fifty miles; in the second from 62° to 83½°, or 21½° in forty-six miles. At Charleston the rise in the twenty fathom curve is from 67½° to 79° in fifteen miles; at St. Simon's from 70° to 76°, in twelve miles. The rate is between four-tenths and eight-tenths of a degree to the mile.

Of the cold band inside of this I shall speak again. The two outside ones, though characterized by much smaller differences of temperature than between the axis and the cold wall band, are sufficiently marked, and should be known, because in crossing the stream after warm water is met with to find cold, then again warm, then cold, would baffle the navigator who was looking for no such alternations, and would greatly instruct him if he knew what to expect.

3d. The alternate cold and warm bands are represented on the chart A from a first discussion of the Coast Survey observations. Their positions may be somewhat changed by a more complete discussion. The line which crosses the Sandy Hook Section at A is the axis of the Gulf Stream, taking the general directions of the bends of the coast, rather of those below than above water, and thrown quite eastward by the shoals off the Southern Coast of New-England. We have not yet traced it further than is shown in the diagram, but of course propose to do so. We know, however, that one branch reaches the shores of Ireland, parting with its heat as it goes, but retaining enough to reproduce there, as Prof. Harvey, of Dublin, has remarked, the algæ of the Florida Coast. The shading upon the map is intended to represent the higher temperatures by the deeper shades.

The axis of the next warm band, which is well made out in the observations, crosses the Sandy Hook Section at C. It is not certain whether G, on the Charleston Section, connects with it or not: the more probable supposition is shown on the Chart, leaving to future observations to settle the point; the bands M and L are perfectly well defined from St. Augustine to Charleston. There was another pair of cold and warm bands noted on the Cape Henry Section, and shown on the diagram, between the hot water of the Gulf Stream, and the band which, north of this, is the first cold band outside.

There is an axis of warm water distinctly shown on the Cape May and Hatteras Sections, beyond the last ones inserted on the Chart, but its position is not well determined. Warm water was found on the Cape Henry and Hatteras Sections, as far E. and S. as shown on the diagram.

Inside of the Gulf Stream, marked by E, a band of warmer water than the surrounding ocean, shows itself before striking soundings to the north, but afterwards on the southern coast. This is well marked by the observations on all the Sections, though its position is not so well determined as the others.

The axis of the most marked cold band, the minimum of temperature which forms the "Cold Wall," follows the shore and shoals in its bendings, even more closely than the axis of the Gulf Stream. This is traced from our observations beyond the range of the other lines, with considerable probability, to longitude 66°.

The two axes of cold water outside are marked, where they cross the Sandy Hook Section, by the letters D and F. Beyond the last of these many of the Sections show a line of minimum temperature, on striking soundings, but its position is not well determined.

North of Hatteras, the Sections show another line of minimum temperature, on striking soundings of from one hundred and fifty to seventy-five fathoms.

4th. To understand this distribution of temperature, it must be remembered that the warm water of the Gulf Stream rests on a cold current from the north, flowing towards Cape Florida, the coldest water keeping near the Atlantic Coast, below the surface, if not at it. The following table will prove this, though it contains but a few of the very numerous observations.

TABLE,

SHOWING THE TEMPERATURE BELOW THE SURFACE AXIS OF THE GULF STREAM, AT FOUR HUNDRED FATHOMS, FROM SANDY HOOK TO CAPE FLORIDA. THE TEMPERATURE OF THE SURFACE CORRESPONDING TO THESE TEMPERATURES BELOW, EXCEEDED 80°.

			Fahr.°
Sandy Hook,	July,	1846,	51.
Cape May,	August,	"	51.
Cape Henry,	"	"	54½.
" "	"	1848,	53½.
Cape Hatteras,	July,	1846,	51.
Cape Fear,	June,	"	51.
Charleston,	June,	"	55.

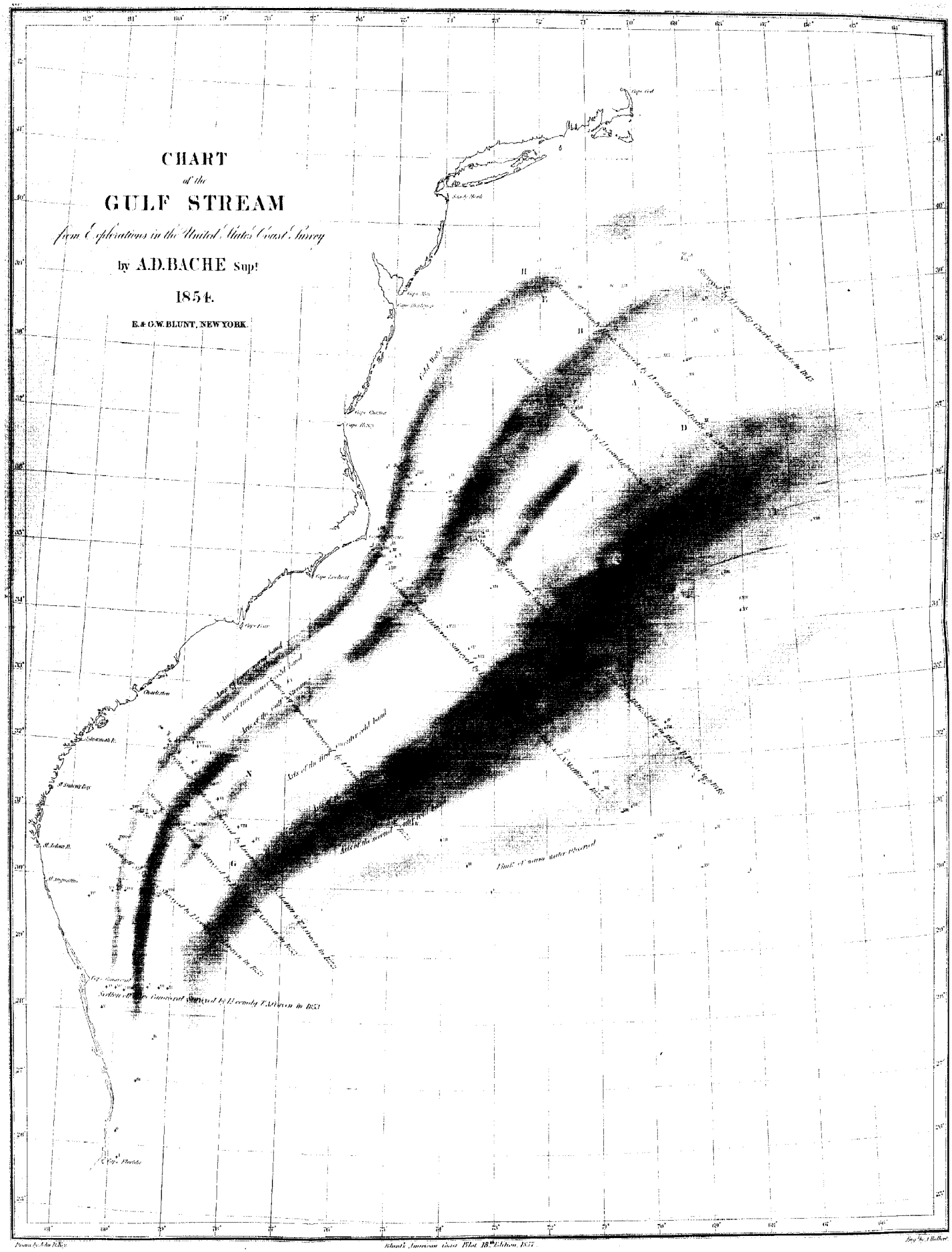


CHART
of the
GULF STREAM
from Explorations in the United States Coast Survey
by A.D. BACHE Supt
1854.
E. & G.W. BLUNT, NEW YORK.
Cape Cod
Sandy Hook
Cape May
Cape Henlopen
Cape Charles
Cape Henry
Cape Lookout
Cape Fear
Charleston
St Augustine
Cape Canaveral
Section of the Continental Shore surveyed by Lieut. T. A. Craven in 1853
Cape Florida
Gulf Weed
Limit of warm water observed
Section of the Coast surveyed by Lieut. Commdr. Charles Wilkes in 1847
Section of the Coast surveyed by Lieut. Commdr. T. A. Craven in 1852
Section of the Coast surveyed by Lieut. Commdr. T. A. Craven in 1853
Section of the Coast surveyed by Lieut. Commdr. T. A. Craven in 1854
Section of the Coast surveyed by Lieut. Commdr. T. A. Craven in

			Fahr.
St. Simon's,	June,	1853,	54.
St. Augustine,	"	"	51.
Cape Canaveral,	"	"	46½.
Fort Jupiter,	"	"	46.
Hillsboro' Inlet,	"	"	51.
Cape Florida,	"	"	51.

At 1000 fathoms off Cape Hatteras, the temperature was but 40

The warm water of the Gulf Stream is of very different depths at different points of its course, and in different parts of any one of the Sections across it. From the deepest portion in the cross-sections, the warmer water flows off towards the shore and outwards, overlaying the cold. The way in which it thins off is seen in the annexed Diagram (No. 3), from the Sandy Hook Section, where the curves of 80°, 75° and 70° of temperature are shown. All the water above the curve a b c d e, is above the temperature of 80°, so between it and curve f g h i k, is between 75° and 80°. This thins out as it approaches the shore; the cold water which lies on the bottom coming up in the northern Sections, but the warm water prevailing to the very shore, and at considerable depths, in the southern. When the cold water is forced up by a bank or shoal, or when it comes to the surface from the thinning out of the warm, there is of course a considerable change of temperature. This cold water from the north prevails on the inside of the cold axis at moderate depths, as far south as Hatteras. At thirty fathoms, twenty nautical miles from Hatteras Light, in August, 1853, the temperature was 60°, bottom being found at thirty-three fathoms. At twelve miles it was 74° at the surface, and in five and ten fathoms, the bottom being at eighteen fathoms. The highest temperature in that Section, and at that time, in the axis of the Gulf Stream, was 78°. One hundred and eight miles from Sandy Hook, in August, 1846, the temperature of the axis of the Gulf Stream being 84°, the surface temperature was 71¼°, at five fathoms, 67°, at ten fathoms, 66°, at fifteen fathoms, 65°, at twenty, 58°, and at thirty fathoms, 52½°, diminishing in the first fifteen fathoms 6¼°, and in the second 12½°. This is the cold counter-current which gives character as well as motion to the water near the shore north of Hatteras. We have seen that the cold wall is not cut off at Hatteras, and it is altogether probable, from the observations of Lieut. Com'g Maffit's party this year, that the counter-current still prevails south of Hatteras. Acting-Master Jones found it about fifty miles S. E. of Charleston Light, running to the S. W., or along the shore, the surface water being 75°, and that at twenty fathoms, 68°, and in the axis of the Gulf Stream, 82°. The distance from this point to the axis was about twenty-three miles, so that moderately warm water extends to the very bottom.

As it was found desirable, if not absolutely essential, to direct special attention to the solution of one problem at a time, our results for currents are not numerous, but they are sufficient to show a general tendency near the surface from the axis of the Gulf Stream outwards, besides the onward current.

The direction of the axis of the Stream shows, therefore, the set of the current in that band. To the right and left of it, the current is outward and onward, and to the left, as far as the cold wall, is inward and onward. Inside of the cold wall, north of Hatteras, and probably south of it, the current is to the southward, or along the coast. The rate of the current in the axis of the Stream, on the Cape Canaveral Section, is about three nautical miles per hour, on the Cape Fear Section about two miles, and on the Sandy Hook Section about one mile per hour.

5th. The observations of this year have fully proved that in the Charleston Section, and those south of it, the bands of cold and warm water are produced by the shape of the bottom of the sea. The Diagram (No. 4) shows this shape on the Charleston Section. The party of Lieut. Maffit carried soundings 68 miles from Charleston Light, and after losing them at 600 fathoms for 32 miles, sounded in three hundred fathoms, then in 550 fathoms, and so on to the limits of the Section, 210 miles. This gives a section of the bottom, as shown on the Diagram, sloping gradually to twenty fathoms, then more rapidly to one hundred fathoms, and falling off suddenly. The next sounding, thirty miles from the one hundred fathoms, was on an elevation sloping rapidly on the in-shore side, less steep on the off-shore, but rising three hundred fathoms above the bottom eleven miles southward and eastward, then another elevation, and then onward as if tracing some of the hills and valleys far inland. This ridge was discovered independently by Lieut. Craven, within two days and a half of Lieut. Maffit's first finding it on the Canaveral Section, struck again by him on the next two Sections, and again, just north of this, on the Charleston Section, without being aware of the previous discovery.

The curve of temperature of 57°, traced on this Diagram (No. 4), follows with great precision the shape of the bottom, which is the more remarkable that every observation involved in it is entirely independent of every other, and that the results of many positions and many depths at the same position are concerned in the tracing of that curve. The curve of 62° has but a single irregularity. These elevations force up the cold water into the warm, and cause the cold streaks and the division into warm and cold bands. There is

one narrow band on the Charleston Section which does not extend below a certain depth, and which shows that other causes may produce them, as indeed we know must be the case; but with two exceptions, the distribution of temperature of the water in this Section, and all south of it, are proved to be connected with the form of the bottom. Just on the crest of the steep slope in-shore, a cold band is formed by the forcing of the cold water upwards, and very remarkably, on part of the St. Simon's Section, which is drawn on the Diagram No. 5, to show the fact.

I remarked while noticing the bands on the Northern Section, that one of low temperature occurred first when soundings of about one hundred and fifty to seventy fathoms were struck. This is a similar case to the one we are now considering, as the sections on the Coast Survey Chart, from Cape May to Gay Head, made without any reference whatever to this subject, fully show. It is, in fact, only an extension of the principle of the forcing up of the cold water on shoals. If the strata of water were parallel to the bottom, the cold water would come nearer the surface, but it rises even higher than this as the current flows along these steep slopes.

Is the figure of the bottom the cause of the distribution of temperatures in the northern sections? It seems almost irresistible to generalize, but as the question is one which we can answer by observation, it is better to let speculation wait upon the facts.

6th. In regard to the permanence of these bands of temperature, and the possibility of determining their position with reasonable precision, it may be proper to make some remarks. The Cape Henry Section was run over three times, the Hatteras twice, the Charleston twice, for the very purpose of making such comparisons as would connect together the observations of different years. The comparisons thus made, show that the differences are of the same class as those which affect the position of the Gulf Stream, in different years, at different seasons, and under different circumstances, as wind and the like. The distances of the positions at which observations were taken, varied with the character of the changes, being less distant as the changes were greater. This will affect the degree of accuracy of the result. The southern Sections presented all the phenomena on so small a scale, comparatively, that there the positions succeeded each other at small intervals. The most marked changes would of course, even were the observations but equally numerous, be best determined.

Another mode of ascertaining how far the results may be depended on, is to determine the discrepancies which they show at the different depths. The whole of the results showed as a general rule, to which the exceptions were readily understood, that the points of highest and lowest temperature were sensibly in the same perpendicular line, except those of the axis of the "cold water" and of the Gulf Stream, which are forced by the action of the cold water further from the shore, according to a law which the observations make out. The discrepancies from the mean positions, agreed well with the determinations from the observations above referred to, and the liability to error computed numerically, was always considerably less than the half of the average distance between the positions. As far as I have as yet been able to examine the results, this is the general conclusion.

7th. The variations of temperature in different years and at different seasons, is considerable. In the observations made during the same season, the more southwardly Sections gave in general the highest temperatures. Not to complicate the examinations with surface irregularities, if we compare the maximum temperatures at twelve or fifteen fathoms below the surface of the different Sections in the same year, we shall find as a general rule, an increase of temperature in passing southward, as 81°, 83°, 82°, from the Sandy Hook to the Cape Henry Section in 1846, 75½°, 76°, 77½°, 79½°, from the Charleston Section to Cape Canaveral. But in the successive years we have found the highest temperatures at twelve fathoms, on the Cape Henry Section higher than that of Hatteras; and the temperatures in July, 1846, on the axis of the Gulf Stream, higher at Sandy Hook than in June, 1853, at Canaveral, by a degree and a half, and higher than at Charleston by five and a half degrees.

8th. The law of change of temperature with depth which has been developed, is that of the conduction of heat through a liquid. The low temperatures reached, showed that the Gulf Stream is comparatively a superficial current, and is underlaid by a vast ocean of cold water—so cold as not only to compensate for the increased warmth of the earth in descending, but to carry to the southern regions the temperature of the far north.

This underlaying water, where it "crops out" on shoals at the shore, shows a sudden decrease of temperature in the surface of the ocean.

9th. In exploring the Gulf Stream, it was crossed, as already stated, in sections, as nearly in right angles to its axis as practicable, continuing the section until the general ocean on the opposite side of the stream from the coast was reached.

The temperatures were observed from the surface to the depth nearly of 500 fathoms, varying, at first, by depths of ten fathoms, and afterwards, as the difference of temperature in descending became less considerable, by greater difference of depth. In a few cases the depth reached was 13 and 1500 fathoms—one mile and three-quarters nearly.

At great depths, the pressure to which the instruments are exposed is such as to re-

quire special ones for measuring the temperatures. Many trials were made of different kinds of instruments, but the most successful was Saxton's metallic thermometer, which has been described in the "Memoir on the Dangers and Ice of the North Atlantic," fourth edition, 1852, and which continues to be used in our work with satisfactory results.

Such a thermometer, with a scale showing every two degrees of Fahrenheit, would not be an expensive instrument; and as it takes the temperature of the sea very rapidly, and registers it almost infallibly, much time would be saved to the navigator by its use.

9th. The investigations from which the foregoing results were deduced having been made at considerable depths, it may be objected to them that they were not strictly confined to obtaining results desirable in practice.

A sufficient reply to this objection would be, that the laws sought to be ascertained were best displayed in the deep-sea temperatures; and that, unless the exploration embraced the whole of the scientific connections of the problem, it would be sure, in the end, to fail in the developments necessary for practice. Besides, why should not the navigator be provided with a suitable thermometer, and take temperatures at just such depths as are best suited to guide him as to his position? In the progress of the art of navigation, I have no doubt that observations of this kind will become common.

The surface of the Stream, changed in its motion and temperature by winds and rain, is not the portion where the laws which govern either are to be expected to display themselves with regularity.

The temperature observations at the surface, ten and fifteen fathoms, have been found irregular, especially the former. Below twenty fathoms to the considerable depths of about one hundred and twenty fathoms, when the change in the phenomena becomes marked, there is much more constancy in the results. The depth of twenty, and even thirty fathoms, can be explored by a common Six's self-registering thermometer, an inexpensive instrument, without appreciable error, and even by a common thermometer enveloped in cotton, or other bad conducting material, allowed to remain below the surface a sufficient time to take the temperature, and then drawn rapidly up and observed promptly.

The depth of twenty fathoms is recommended to navigators for their observations.

A common thermometer surrounded by a copper case, say three inches in diameter, stuffed near the bulb of the instrument with cotton, will answer a good purpose. Six's self-registering thermometer, which may be had at any of the instrument makers, will be still better.

The most prominent phenomena only are moderately permanent at the surface.

DEPTHS OF OBSERVATIONS FOR TEMPERATURE IN THE GULF STREAM.

(*In fathoms.*)

Section off Block Island, by Lieut. Chas. A. Davis, in 1845.		Section off Sandy Hook, by Lieut. Geo. M. Bache, in 1846.		Section off Cape May, by Lieut. Geo. M. Bache, in 1846.		Section off Cape Henry, by Lieut. Geo. M. Bache, in 1846.		Section off Cape Henry, by Lieut. S. P. Lee, in 1847.		Section off Cape Henry, by Lieut. Richard Bache, in 1848.		Section off Cape Hatteras, by Lieut. Richard Bache, in 1848.		Section off Cape Hatteras, by Lieut. J. N. Maffitt, in 1853.		Section off Cape Fear, by Lieut. J. N. Maffitt, in 1853.		Section off Charleston, by Lieut. J. N. Maffitt, in 1853.		Section off Charleston, by Lieut. T. A. Craven, in 1853.		Section off St. Simon's Bay, by Lieut. T. A. Craven, in 1853.		Section off St. Augustine, by Lieut. T. A. Craven, in 1853.		Section off Cape Carnaveral, by Lieut. T. A. Craven, in 1853.		Irregular Observations, by Lieut. T. A. Craven, in 1853.	
Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.	Position.	Depth.
...	...	I	670	I	33	X	20	XIII	47	I	18½	XII	17	I	10	XI	73?	a	10	XXXIV	80	XXV	28	XV	19	VI	20	I	550
...	...	...	...	...	...	XI	50	...	...	II	24	XIII	60	II	12	X	70?	b	20	XXXV	215	XXVI	100	XVI	135	VII	30	II	500
...	...	...	...	...	...	...	...	...	...	...	...	XI	25	III	33	...	...	d	20	XXXVI	250	XXVII	150	XVII	300	VIII	150	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	IV	75	...	...	c	30	XXXVII	480	XXX	500	XX	560	XII	400	IV	600
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	e	30	XXXIX	600	XXXII	520	XXI	450	XI	460	V	15
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	f	50	...	...	...	...	...	...	...	...	XIV	150
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	I	100	...	...	...	...	...	...	...	...	XXIV	20
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	IV	550	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	V	300 to 400	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	VI	450	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	VII	500	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	VIII	470	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	IX	460	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	X	460	...	...	...	...	...	...	...	...	...	...

ADDITIONAL REMARKS.

In addition to the foregoing, the following general facts may be stated :—

1. That in the summer, the temperature of the Gulf-water, South of Hatteras, is about the same as the water on soundings. In the months of July and August, 1845, the temperature of the water from the Mississippi to Cape Hatteras, both in and out of the stream, even to the very mouth of the Atlantic rivers, was 84° to 82°. This fact was ascertained by journals kept for the editor.

2. That the temperature of the Gulf South of Hatteras to Savannah, in the winter months, is from 72° to 75°; and that on soundings within the same limit, at the same time, 59° to 68°, and North of Hatteras, 48° to 64° : showing a difference of from 11 to 5 degrees higher to the South of the cape.

3. The general direction of the Gulf Stream, from Key Biscayno until it gets to the lat. of 31° 10′, is North, velocity 3 to 3½ knots ; from thence it turns to the N.N.E., and as it progresses to the North, it turns more to the N.E. On the Western edge of the Stream the Gulf-weed is mixed with the river-sedge ; on the Eastern edge it is clean as when first torn from the rocks. It appears from a notice in the Nautical Magazine, that some of the weed grows on the shores of the Andros Islands.

4. The Western edge, from Key Biscayno to lat. 31° 10′ N., is generally on the meridian of 80° ; the Eastern edge, after passing the Little Bahama Bank, is about 79°, until in the latitude 30° 30′, when it is turned more to the Eastward. This, however, is in moderate weather. During heavy gales from the N.E. to the S.E., the stream is forced immediately on and over the shoals of the capes of North Carolina ; and with N.W. and Westerly gales, the stream is driven from the shore, and no limit within 30 miles can be fixed to it ; and under such circumstances the warm water of the Gulf is displaced, so that at times there will be no current in the warm water, and current in the cold water.

5. The edges, in moderate weather, are shown by the ripplings in the low latitudes, and in the high latitudes, during the winter, with Northerly weather, by the evaporation from the surface.

6. The precise part where the stream begins to form is not known. It is shown before, under the general article of "Currents," that the current sets to the W.N.W. and N.W., over the Campeche Bank ; and that at a short distance West of the Tortugas, the current sets to the S.S.E. ; but where the proper head of the current is, is yet to be found.

7. On the Western side of the Gulf Stream, from Sandy Hook to Hatteras, the current sets South, a little Westerly, about 20 miles in 24 hours.

8. On the Eastern side of the Gulf Stream, nearly down to Matanilla Reef, the current sets to the South and West, almost opposite to the flow of the Gulf, at an average of 20 miles in 24 hours : the New Orleans steamers take advantage of it by crossing the Gulf stream near Hatteras, and from about 33° 30′ N. lat., 74° 30 W. long., steering directly for Matanilla Reef.

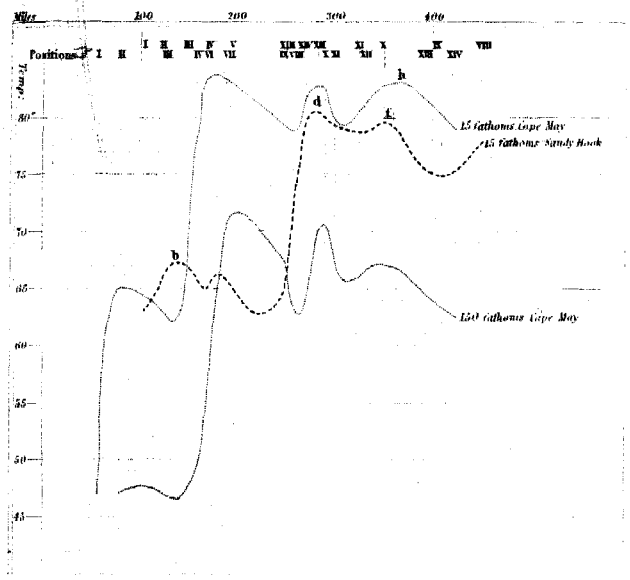
Of the Stream to the Eastward of the Coast Survey examination we want definite information. The following is the most accurate observation we have :

Ship Trade Wind, on the 26th of June, at 11h. 30m. P. M., came in contact with the ship Olympus, and both vessels went down in lat 41° 30′, long. 57°. On the 1st of July, 2h. 30m. P. M., the ship Empire took a sailor from the foremast of the Trade Wind, in lat. 42°, long. 55° 30′, showing that the mast had drifted 72 miles on a N. 66° E. true course, in 101 hours, making $\frac{72}{101}$ of a knot, nearly, an hour.

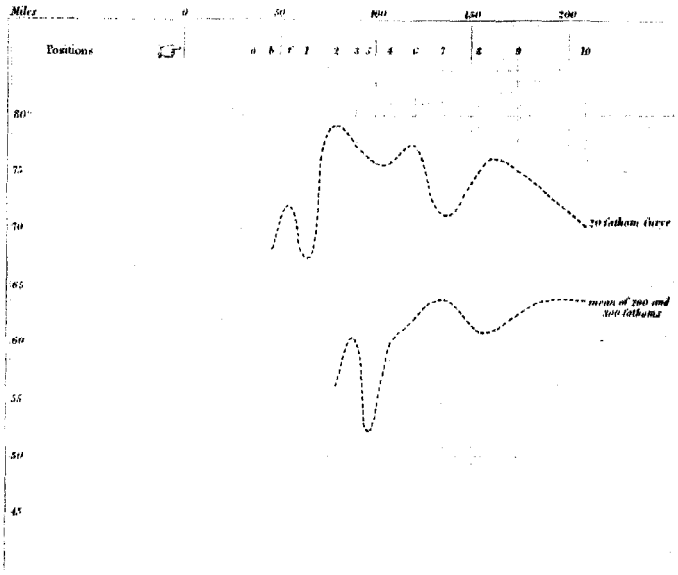
G. W. BLUNT.

May, 1854.

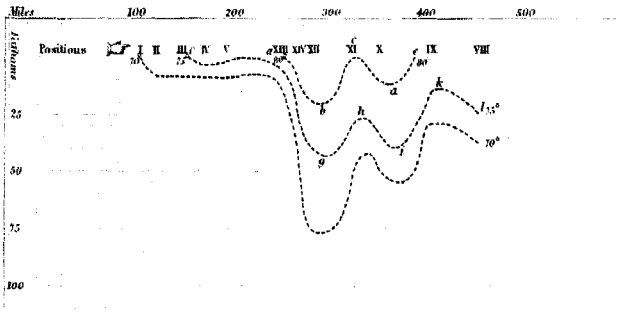
Nº 1. Sandy Hook ... and Cape May ..... Sections. Curves showing the temperatures at the same depth. Distances from Sandy Hook and Cape May ..... in nautical miles at the top. Temp: by Fahr.t Thermometer at the side.



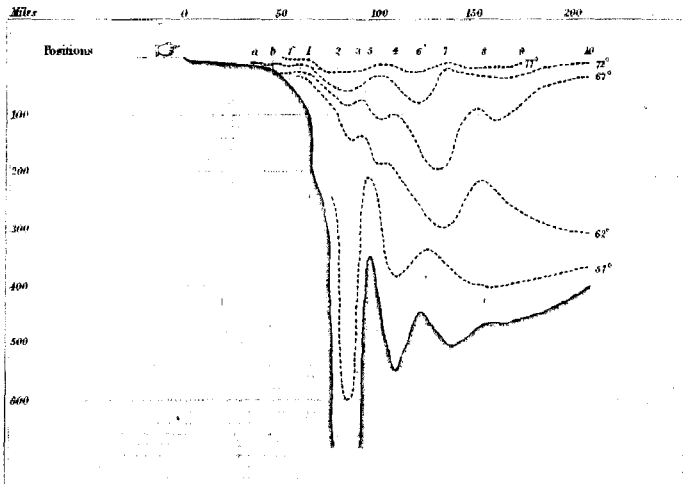
Nº 2. Charleston Section. Curves showing the temperatures at the same depth. Distances from the Charleston shore in nautical miles at the top and Temp: by Fahr.t at the side.



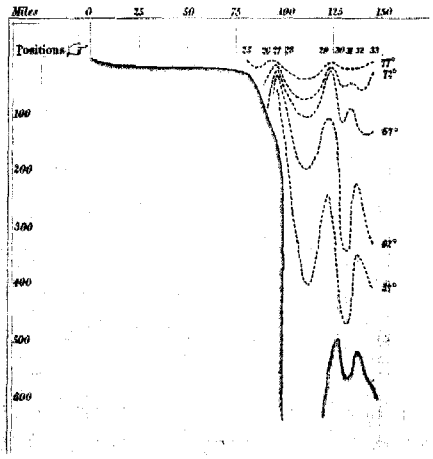
Nº 3. Sandy Hook Section. Curves showing the depth at the same temperature. Distance from Sandy Hook in nautical miles at the top & Depth in fathoms at the side.



Nº 4. Charleston Section. Curves showing the depths at the same temperatures and the outline of the bottom. Distances from Charleston shore in nautical miles at the top and Depth in fathoms at the side.



Nº 5. St Simon's Section. Curves showing the depth at the same temperatures & the outline of the bottom. Distances from shore at top in nautical miles. Depth in fathoms at the side.



Blunt's American Coast Pilot 18th Edition 1857.

TIDE TABLES,

For the use of Navigators; prepared from the Coast Survey Observations by A. D. Bache, Superintendent.

[Furnished by authority of the Treasury Department, to E. & G. W. Blunt, New York, and revised Jan., 1857.]

The following Tables will enable navigators to ascertain the time and height of high and low water in some of the principal ports of the United States. The results are approximate, the observations being still in progress, but they may safely be used for practical purposes. The number of places of observation, and the time during which many of them have been made, are steadily on the increase as the coast survey advances.

The tides of the coast of the United States, on the Atlantic, Gulf of Mexico, and Pacific, are of three different classes. Those of the Atlantic are of the most ordinary type, ebbing and flowing twice in twenty-four hours, and having but moderate differences in height between the two successive high waters, or low waters; one occurring before noon, and the other after noon. Those of the Pacific coast also ebb and flow twice during twenty-four hours; but the morning and afternoon tides differ very considerably in height—so much so, that at certain periods a rock which has three feet and a half water upon it at low tide, may be awash on the next succeeding low water. The intervals, too, between successive high and successive low waters may be very unequal. The tides of ports in the Gulf of Mexico west of Cape St. George, ebb and flow, as a rule, but once in twenty-four hours, or are single-day tides. At particular parts of the month there are two small tides in the twenty-four hours. The rise and fall in all these ports is small. East of Cape St. George the rise and fall increases: there are two tides, as a rule, during the twenty-four hours, and the daily inequality, referred to in the Pacific tides, is large.

These peculiarities require a different way of treating the cases, and in some of them separate tables.

I propose to enable the navigator to find, from the Nautical Almanac and the following tables, the time and height of high and low water at any date within the ordinary range of difference produced by winds and other variable circumstances. I will endeavor to divest the matter of unfamiliar technical expressions as far as practicable, though, for shortness' sake, some such terms may be employed after defining them. The discussion of the Gulf tides has not been carried so far as to enable me to present the results in as definite a form as the others.

As is well known, the interval between the time of the moon's crossing the meridian (moon's transit) and the time of high water at a given place is nearly constant; that is, this interval varies between moderate limits, which can be assigned. The interval at full and change of the moon is known as the establishment of the port, and is ordinarily marked on the charts. As it is not generally the average of the intervals during a month's tide, it is a less convenient and less accurate quantity for the use of the navigator than the average interval which is used on the Coast Survey charts, and is sometimes called the "mean" or "corrected establishment."*

The following Table gives the principal tidal quantities for the different ports named in the first column, where they are arranged under specific heads. The third column of the table gives the mean interval, in hours and minutes, between the moon's transit and the time of high water next after the transit; the fourth, the difference between the greatest and least interval, occurring in different parts of the month, (lunar.) A simple inspection of this column will show how important it is to determine these changes in many of the ports where they amount to more than half an hour, or to more than fifteen minutes, for the average interval.

The fifth, sixth, and seventh columns refer to the height of the tide. The fifth gives in feet the average rise and fall, or average difference between high and low water. The sixth gives the greatest difference, commonly known as the rise and fall of spring tides; and the seventh the least difference, known as the rise and fall of the neap tides.

The average duration of the flood, or rising tide, is given in the eighth column; of the ebb or falling tide, in the ninth; and of the period during which the tide neither rises nor falls, or the "stand," in the tenth. The duration of flood is measured from the middle of the stand at low water to the middle of the stand at high water, so that the whole duration from one high water to the next, or from one low water to the next, should be given by the sum of the numbers in the eighth and ninth colums.

* This term was introduced by the Rev. Mr. Whewell, who has done so much for the investigation of the laws of the tides.

At most of these places given in the list, a mark of reference has been established for the height of the tide. I have omitted the description of these marks, (except in the following localities,) as of no particular interest in this connexion.

BENCH-MARKS.

Boston.—The top of the wall or quay, at the entrance to the dry dock in the Charlestown navy yard, is fourteen feet $\frac{76}{100}$ (14.76 feet) above mean low water.

New York.—The lower edge of a straight line cut in a stone wall, at the head of the wooden wharf on Governor's island, is fourteen feet $\frac{51}{100}$ (14.51 feet) above mean low water. The letters U. S. C. S. are cut in the same stone.

Old Point Comfort, Va.—A line cut in the wall of the light-house, one foot from the ground, on the S.W. side, is eleven feet (11 feet) above mean low water.

Charleston, S. C.—The outer and lower edge of embrasure of gun No. 3, at Castle Pinckney, is ten feet $\frac{13}{100}$ (10.13 feet) above mean low water.

TABLE I.

Tide Table for the Coast of the United States.

PORT.	STATE	Interval between time of ☽'s trans. & time high wt'r.		Rise and fall.			Mean duration.		
		Mean interval.	Diff. betw'en greatest and least inter'ls	Mean.	Spring tides.	Neap tides.	Flood tide.	Ebb tide.	Stand.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		h. m.	h. m.	feet.	feet.	feet.	h. m.	h. m.	h.m.
Coast from Portland to N. Y.									
Portland	Maine	11 25	44	8.8	10.0	7.6	6 14	6 12	20
Portsmouth	N.H.	11 23	53	8.6	9.8	7.2	6 22	6 07	21
Newburyport	Mass.	11 22	50	7.8	9.1	6.6	5 16	7 09	24
Salem	Mass.	11 13	50	9.2	10.6	7.6	6 19	6 06	06
Boston Light	Mass.	11 12	35	9.3	10.9	8.1	6 20	6 06	15
Boston	Mass.	11 27	44	10.0	11.3	8.5	6 13	6 13	09
Nantucket	Mass.	12 24	37	3.1	3.6	2.6	6 23	5 44	09
Edgartown	Mass.	12 16	.....	2.0	2.5	1.6	6 51	5 29	24
Holmes' Hole	Mass.	11 43	31	1.7	1.8	1.3	6 41	5 21	12
Tarpaulin Cove	Mass.	8 04	49	2.4	2.6	2.0	6 09	6 17	34
Wood's Hole, N. side	Mass.	8 06	.....	3.9	.....	.....	6 31	5 51	.....
Wood's Hole, S. side	Mass.	8 56	.....	1.5	.....	.....	6 03	6 22	.....
Bird Island Light	Mass.	7 59	45	4.4	5.3	3.5	6 51	5 58	.....
New Bedford entrance, (Dumpling Rock)	Mass.	7 57	41	3.8	4.6	2.8	6 50	5 33	42
Newport	R. I.	7 45	24	3 9	4.6	3.1	6 21	6 03	23
Point Judith	R. I.	7 32	46	3.1	3.7	2.6	6 12	6 10	1 0
Block Island	R. I.	7 36	41	2.8	3.5	2.0	6 23	6 2	5
Montauk Point, L. I.	N. Y.	8 20	1 11	1.9	2.4	1.8	6 17	6 7	31
Sandy Hook	N. Y.	7 29	47	4.8	5.6	4.0	6 10	6 15	16
New York	N. Y.	8 13	46	4.3	5.4	3.4	6 0	6 25	28
Tarrytown	N. Y.	9 57	58	3.5	4.0	2.7	6 06	6 20	43
Long Island Sound.									
Watch Hill	R. I.	9 00	23	2.7	3.1	2.4	6 35	5 56	14
Stonington	Ct.	9 07	30	2.3	3.4	2.1	6 15	6 10	25
Little Gull Island	N. Y.	9 38	1 07	2.5	2.9	2.3	6 01	6 21	37
New London	Ct.	9 28	52	2.6	3.1	2.1	5 56	6 26	22
New Haven	Ct.	11 16	1 08	5.8	6.6	5.1	6 24	6 05	.....
Bridgeport	Ct.	11 11	1 03	6.5	8.0	4.7	6 01	6 07	.....
Oyster Bay, L. I.	N. Y.	11 07	51	7.3	9.2	5.4	6 08	6 24	.....
Sands' Point, L. I.	N. Y.	11 13	31	7.7	8.9	6.4	5 55	6 30	14
New Rochelle	N. Y.	11 22	32	7.6	8.6	6.6	5 51	6 35	13
Throg's Neck	N. Y.	11 20	39	7.3	9.2	6.1	5 50	6 33	43
Coast of New Jersey.									
Cold Spring Inlet	N. J.	7 32	51	4.4	5.4	3.6	6 08	6 18	.....
Cape May Landing	N. J.	8 19	47	4.8	6.0	4.3	6 11	6 15	20

TABLE I.—Continued.

PORT.	STATE	Interval between time of ☽'s trans. & time high wt'r.		Rise and fall.			Mean duration.		
		Mean interval.	Diff. betw'en greatest and least inter'ls	Mean.	Spring tides.	Neap tides.	Flood tide.	Ebb tide.	Stand.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		h. m.	h. m.	feet.	feet	feet.	h. m.	h. m.	h. m.
Delaware Bay and River.									
Delaware Breakwater....	Del.	8 00	50	3.5	4.5	3.0	6 15	6 6	26
Higbee's, Cape May.....	N. J.	8 33	43	4.9	6.2	3.9	6 26	6 0	.....
Egg Island Light	N. J.	9 04	51	6.0	7.0	5.1	5 52	6 27	.....
Mahon's River.....	Del.	9 52	48	5.9	6.9	5.0	6 11	6 11	.....
New Castle	Del.	11 53	.....	6.5	6.9	6.6	5 06	6 43	47
Philadelphia	Pa.	13 18	48	6.0	6.8	5.1	4 52	7 6	.....
Chesapeake Bay & Rivers.									
Old Point Comfort	Va.	8 17	50	2.5	3.0	2.0	6 01	6 25	.....
Point Lookout.....	Md.	12 58	45	1.4	1.9	0.7	5 59	6 19	35
Annapolis.....	Md.	16 38	40	0.9	1.0	0.8	6 11	6 15	32
Bodkin Light.....	Md.	17 42	48	1.0	1.3	0.8	5 23	7 8	.....
Baltimore.....	Md.	18 33	43	1.3	1.5	0.9	5 54	6 33	.....
James River, (City Point).	Va.	14 14	.....	2.6	....	....	5 28	6 52	40
Richmond.....	Va.	16 28	.....	2.9	....	....	4 52	7 34	.....
Coast of N. and S. Carolina, Georgia, and Florida.									
Hatteras Inlet.....	N. C.	7 4	57	2.0	2.2	1.8	6 7	6 7	50
Beaufort.....	N. C.	7 26	50	2.8	3.3	2.2	6 11	6 10	42
Bald Head.....	N. C.	7 26	34	4.3	5.0	3.4	6 18	6 17	31
Smithville, (Cape Fear) ..	N. C.	7 19	47	4.5	5.5	3.8	6 1	6 26	26
Charleston,(Cas.Pinckney)	S. C.	7 13	36	5.3	6.3	4.6	6 36	6 9	33
Fort Pulaski, (Sav. entr.)..	Ga.	7 20	41	7.0	8.0	5.9	5 49	6 35	26
Savannah, (Dry dock wh'f)	Ga.	8 13	51	6.5	7 6	5.5	5 4	7 22	14
Doboy Light-house.....	Ga.	7 33	55	6.6	7.8	5.4	6 2	6 20	.....
St. Simon's.....	Ga.	7 23	44	6.1	7.3	5.0	4 57	7 36	19
Fort Clinch.....	Fla.	7 53	1 06	5.9	6.7	5.3	6 9	6 17	.....
St. John's River.....	Fla.	7 31	48	4.6	5.5	3.2	5 59	6 26	15
St. Augustine	Fla.	8 32	43	4.2	4.7	3.5	6 7	6 19	35
Cape Florida.....	Fla.	8 16	51	1.5	1.7	1.2	6 0	6 25	45
Indian Key.....	Fla.	8 18	49	1.8	2.4	1.2	6 36	5 48	19
Sand Key.....	Fla.	8 40	.....	1.2	2.0	0.6	6 31	5 55	13
Key West.....	Fla.	9 22	1 12	1.4	2.3	0.7	6 59	5 25	12
Tortugas	Fla.	9 56	1 32	1.2	1.5	0.6	6 43	5 40	.....
Tampa Bay, (Egmont Key)	Fla.	11 21	1 33	1.4	1.8	1.0	6 36	6 11	43
Cedar Keys, (Depot Key).	Fla.	13 15	1 55	2.5	2.8	1.8	6 12	6 13	.....
St. Mark's	Fla.	13 33	2 0	2.2	2.9	1.2	6 16	6 9	.....
Western Coast.									
San Diego	Cal.	9 50	1 45	3.7	5.0	2.3	6 22	6 0	30
San Pedro	Cal.	9 45	1 48	3.9	4.7	2.2	6 18	6 5	30
Cuyler's Harbor	Cal.	9 25	1 2	3.7	5.1	2.8	6 13	6 5	.....
San Luis Obispo	Cal.	10 14	1 52	3.6	4.8	2.4	6 37	5 50	.....
Monterey	Cal.	10 28	49	3.4	4.3	2.5	6 31	6 2	35
South Farallon	Cal.	10 37	1 16	3.6	4.4	2.8	6 18	6 9	.....
San Francisco, (N. beach).	Cal.	12 6	1 4	3.6	4.3	2.8	6 39	5 51	34
Bodega	Cal.	11 17	1 54	3.6	4.7	2.7	6 19	5 59	.....
Humboldt Bay	Cal.	12 02	1 11	4.4	5.5	3.5	6 19	6 0	.....
Port Orford	O. T.	11 26	1 6	5.1	6.8	3.7	6 19	6 7	39
Astoria	O. T.	12 48	1 13	6.1	7.3	4.5	6 3	6 28	33
Neé-ah Harbor.....	W. T.	12 33	1 28	5.6	7.4	4.8	6 20	6 6	.....
Port Townshend.....	W. T.	3 49	1 3	4.6	5.5	4.0	6 34	5 52	.....
Fort Steilacoom	W. T.	4 46	1 6	9.2	11.1	7.2	6 3	6 25	28

NOTE.—The mean interval in column 3 has been increased by 12 hours for some of the ports in Delaware river and Chesapeake bay, so as to show the succession of times from the mouth. Therefore 12 hours ought to be subtracted from the establishments which are greater than 12 hours, before using them.

The foregoing Table I. gives the means of determining roughly the time and height of high water at the several ports named. The hour of transit of the moon preceding the time of high water is to be taken from the Almanac, and the mean establishment being added, the time of high water results. Thus:

Example I.—It is required to find the time of high water at New York on the 5th of November, 1854. The American Almanac gives $0^h\ 0^m$ as the time of transit of the moon on that day. The mean interval for New York, from Table I, column 3, is $8^h\ 13^m$, which, as the transit was at 0^h, is roughly the time of high water.

The moon being full, the height is that of spring tides of column 6, namely, 4.5 feet. If the soundings on the chart are reduced to low water spring tides, 5.4 feet is to be added to them to give the depth at high water. If the soundings are reduced to mean low water, the rise and fall for mean tides being 1.1 foot less than for springs, the rise or increase of depth will be half of this, or 0.6 of a foot less than 5.4 feet, which is 4.8 feet, or nearly 4 feet 10 inches.

Example II.—Required the time of high water at Boston on the 23d of January, 1851. From the American Almanac we find the time of the moon's southing, or transit, on that day, $5^h\ 18^m$ a. m., and from Table I the mean interval at Boston dry dock is $11^h\ 27^m$.

We have then $5^h\ 18^m$ time of transit; to which add

11	27	mean interval from Table I.
16	45	time of high water, or $4^h\ 45^m$ p. m.

If the Greenwich Nautical Almanac is used, add 2^m to the time of transit of Greenwich for every hour of west longitude, and its proportional part for less than an hour. It will suffice to take the half hour which may be over any number of hours, as the correction for less than this would be less than one minute, and need not be taken into account. Thus Boston is $4^h\ 44^m$ W. of Greenwich. The correction to be applied to the time of transit of the moon at Greenwich is, for the four hours, eight minutes, and for the 44^m one minute. The time of transit on the date assumed in the preceding example is $17^h\ 9^m$ of the 22d, or $5^h\ 9^m$ a. m. of the 23d; to which add nine minutes, the correction just found gives $5^h\ 18^m$, as before ascertained from the American Almanac.

In using the United States Nautical Almanac, in the astronomical part of which the transits of the moon are given for the meridian of Washington, the corrections required may, in this first approximation for the Atlantic coast, be neglected.

To find the time of the next following low water, add from Table I the duration of ebb tide; this gives $4^h\ 45^m$ p. m., time of high water.

6	13	duration of ebb tide, from Table I.
10	58	p. m.

By subtracting the duration of flood tide, we obtain the time of the preceding low water, $10^h\ 32^m$ a. m., recollecting that $4^h\ 45^m$ p. m. is the same as $16^h\ 45^m$ reckoned from midnight.

The height of this tide corresponding to the transit of 5^h will bring it nearly to a neap tide, and the rise and fall, obtained from column 7, Table I, is 8.5 feet.

The next following high water may be had by adding to the time of low water the duration of flood, from Table I, thus: $10^h\ 58^m$ p. m., time of low water 23d of January.

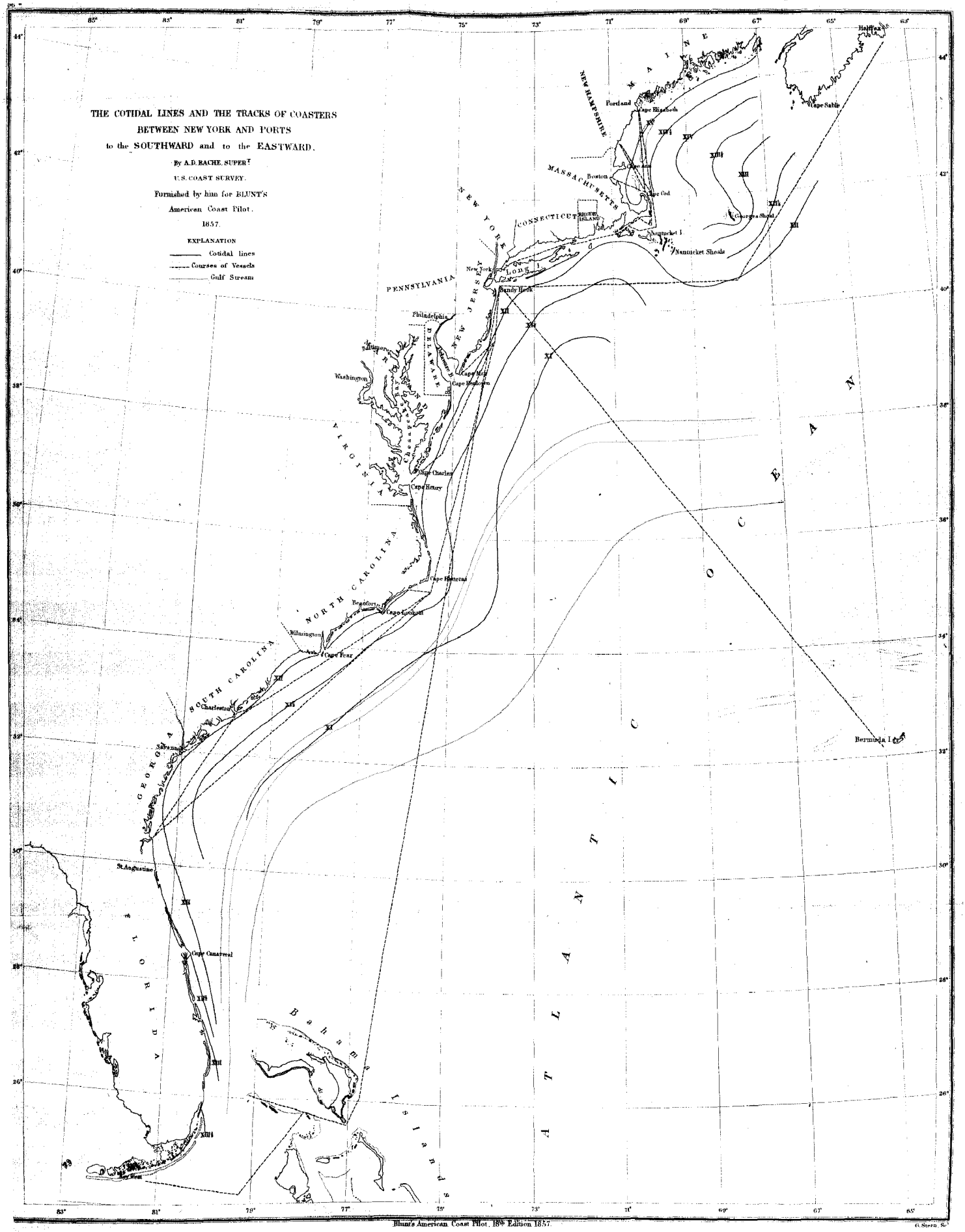
	6	13	duration of flood from Table I.
Sum	17	11	or $5^h\ 11^m$ a. m. on the 24th of January.

Or, having found the time of high water, the time of the next following high water may be found by adding the duration of flood and of ebb together, and their sum to the time of high water found. Thus:

6^h	13^m	duration of ebb tide from Table I.
6	13	duration of flood.
12	26	duration of whole tide.
4	45	p. m., January 23, time of high water.
17	11	or $5^h\ 11^m$ a. m., 24th January, time of the next succeeding high water.

Subtracting the same quantity, will give the time of the preceding high water. Thus:

$4^h\ 45^m$		p. m., or $16^h\ 45^m$ from midnight, is the time of high water.
12	26	the duration of flood and ebb.
4	19	a. m. of the 23d for the preceding high



Blunt's American Coast Pilot, 18th Edition 1857.

G. Steen, Sc.

water. The duration of the flood and ebb being reckoned from the middle of one stand or slack water to the middle of the next, the time of beginning of stand of ebb or flood will be found by subtracting half the duration of stand or slack water given by column 10, Table I, from the time of high or low water, and the time of the end of stand of ebb or flood by adding the same. A nearer approximation to the times and heights of high water may be obtained by the use of Tables II and III.

TABLE II.

Interval between the time of moon's transit and the time of high water, for different hours of transit, and for several different ports.

Time of moon's transit.	Boston, Mass.	New York, N. Y.	Philadelphia, Penn.	Old Point Comfort, Va.	Baltimore, Md.	Smithville, N. C.	Charleston, S. C.	Ft. Pulaski, Savannah R., Ga.	Key West, Fla.	San Francisco, Cal.
h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.
0 0	11 38	8 20	1 31	8 33	6 47	7 26	7 38	7 30	9 26	12 5
0 30	11 33	8 18	1 28	8 27	6 42	7 21	7 34	7 25	9 19	11 59
1 0	11 28	8 15	1 25	8 21	6 37	7 16	7 28	7 19	9 12	11 53
1 30	11 24	8 10	1 21	8 15	6 31	7 13	7 22	7 15	9 6	11 47
2 0	11 20	8 6	1 18	8 9	6 26	7 9	7 16	7 11	9 0	11 41
2 30	11 16	8 0	1 14	8 4	6 21	7 6	7 11	7 8	8 55	11 36
3 0	11 13	7 55	1 11	8 0	6 17	7 4	7 7	7 6	8 51	11 33
3 30	11 10	7 52	1 8	7 56	6 13	7 3	7 3	7 5	8 50	11 33
4 0	11 7	7 52	1 6	7 52	6 11	7 2	7 0	7 4	8 49	11 38
4 30	11 6	7 52	1 3	7 49	6 10	7 3	6 58	7 3	8 53	11 46
5 0	11 6	7 53	1 0	7 48	6 10	7 4	6 58	7 4	8 57	11 55
5 30	11 9	7 56	0 59	7 50	6 13	7 6	6 59	7 6	9 7	12 3
6 0	11 13	7 59	0 59	7 53	6 19	7 9	7 1	7 8	9 17	12 11
6 30	11 19	8 5	1 1	8 0	6 25	7 13	7 4	7 12	9 28	12 16
7 0	11 25	8 11	1 7	8 7	6 32	7 17	7 10	7 16	9 39	12 23
7 30	11 32	8 17	1 15	8 15	6 39	7 23	7 19	7 22	9 45	12 29
8 0	11 38	8 23	1 23	8 24	6 44	7 28	7 28	7 28	9 52	12 34
8 30	11 43	8 27	1 29	8 33	6 49	7 33	7 36	7 34	9 54	12 37
9 0	11 47	8 32	1 34	8 40	6 52	7 37	7 42	7 39	9 56	12 36
9 30	11 48	8 34	1 39	8 45	6 54	7 39	7 45	7 42	9 53	12 34
10 0	11 49	8 35	1 42	8 48	6 53	7 40	7 48	7 43	9 51	12 30
10 30	11 48	8 34	1 43	8 48	6 52	7 40	7 48	7 41	9 45	12 24
11 0	11 47	8 31	1 41	8 46	6 50	7 36	7 46	7 37	9 39	12 17
11 30	11 43	8 25	1 37	8 40	6 48	7 30	7 42	7 34	9 32	12 9

TABLE III.

Showing the rise and fall of tides, and corrections to be applied to determine the height of high water soundings on charts referring to mean low water, and to low water spring tides.

Time of ☽'s transit.	Boston, Mass.			New-York, N. Y.			Philadelphia, Pa.			Old Pt. Comf't, Va.			Baltimore, Md.			Time of ☽'s transit
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Hour.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Hour
0	11.2	10.6	11.3	4.9	4.5	4.9	6.3	6.2	6.3	2.9	2.6	2.9	1.5	1.4	1.6	0
1	11.3	10.6	11.3	4.9	4.5	4.9	6.4	6.4	6.5	3.0	2.7	3.0	1.5	1.4	1.6	1
2	11.2	10.5	11.2	4.7	4.4	4.8	6.6	6.5	6.6	2.9	2.7	2.9	1.5	1.3	1.5	2
3	10.6	10.3	11.0	4.3	4.2	4.6	6.6	6.5	6.6	2.6	2.6	2.8	1.4	1.3	1.5	3
4	10.0	10.0	10.7	3.8	4.0	4.4	6.4	6.4	6.5	2.3	2.4	2.7	1.3	1.2	1.4	4
5	9.2	9.7	10.4	3.5	3.8	4.2	6.1	6.2	6.3	2.1	2.3	2.6	1.1	1.1	1.3	5
6	8.8	9.4	10.1	3.3	3.7	4.1	5.7	5.9	6.0	2.0	2.2	2.5	0.9	1.1	1.3	6
7	8.6	9.3	10.0	3.3	3.7	4.1	5.4	5.6	5.7	2.0	2.3	2.5	0.9	1.1	1.3	7
8	8.9	9.5	10.2	3.6	3.8	4.2	5.2	5.3	5.4	2.2	2.4	2.6	1.0	1.2	1.4	8
9	9.4	9.7	10.4	4.0	4.0	4.4	5.4	5.4	5.5	2.1	2.5	2.8	1.1	1.3	1.5	9
10	10.1	10.0	10.7	4.5	4.3	4.7	5.7	5.7	5.8	2.8	2.7	2.9	1.3	1.4	1.6	10
11	10.7	10.3	11.0	4.8	4.5	4.9	6.0	6.0	6.1	3.0	2.8	3.0	1.4	1.4	1.6	11

TABLE III.—Continued.

Time of ☽'s transit.	Smithville, N. C.			Charleston, S. C.			Tybee Entr., Ga.			Key West, Fla.			San Francisco, Cal.			Time of ☽'s transit.
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Hour.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet*	*Hour.*
0	5.2	4.8	5.1	5.7	5.4	5.7	7.8	7.4	7.8	1.6	1.4	1.6	4.5	4.0	4.4	0
1	5.1	4.8	5.1	5.8	5.4	5.7	7.9	7.4	7.9	1.6	1.4	1.6	3.9	3.7	4.1	1
2	5.0	4.7	5.0	5.6	5.4	5.7	7.6	7.3	7.7	1.5	1.4	1.5	3.7	3.6	4.1	2
3	4.6	4.5	4.8	5.5	5.3	5.6	7.1	7.0	7.5	1.4	1.3	1.5	3.5	3.5	4.0	3
4	4.3	4.4	4.7	5.2	5.2	5.5	6.5	6.7	7.2	1.2	1.2	1.4	3.1	3.3	3.8	4
5	4.0	4.3	4.6	4.9	5.1	5.4	6.1	6.5	7.0	1.0	1.1	1.3	2.8	3.1	3.6	5
6	3.8	4.2	4.5	4.8	5.0	5.3	5.8	6.4	6.8	1.0	1.1	1.3	2.7	3.1	3.6	6
7	3.8	4.1	4.4	4.7	4.9	5.2	6.0	6.5	6.9	1.0	1.1	1.3	3.0	3.3	3.7	7
8	4.0	4.2	4.5	4.8	5.0	5.3	6.4	6.7	7.1	1.1	1.2	1.3	3.4	3.5	3.9	8
9	4.3	4.3	4.6	4.9	5.1	5.4	6.9	6.9	7.4	1.3	1.3	1.4	3.8	3.6	4.1	9
10	4.7	4.6	4.9	5.2	5.3	5.6	7.4	7.0	7.6	1.4	1.3	1.5	4.0	3.8	4.2	10
11	5.0	4.7	5.0	5.5	5.4	5.8	7.8	7.2	7.8	1.6	1.4	1.6	4.2	3.8	4.3	11

In these, the variations in the interval between the moon's transit and high water are shown for some of the principal ports contained in Table I. These variations of interval depend upon the age of the moon, and as they go through their values in half a lunar month, are known as the half-monthly inequality of interval. The table extends from 0^h of transit, midnight of the calendar day, or full of the moon, to 11½ hours. The numbers for "change" of the moon correspond to those for 0 hours, and for 13 hours (or 1 p. m. of the calendar day) to 1 hour, and so on, up to 23 hours. The ports for which the numbers are given are designated by the heading of the columns.

The mean interval, it will be seen, does not occur at full and change, but nearly two days afterwards, on the Atlantic coast. At Key West it occurs more nearly at full and change, and at San Francisco still more nearly.

The same remark applies to the heights; spring tides occur about two days after the full and change of the moon, and neaps two days after the first and last quarter.

The use of this table of nearer approximation is quite as simple as that of Table I.

Rule to find the time of high water.—Look in the Almanac for the time of moon's transit (or southing) for the date required. In the table corresponding to that time will be found the number to be added to the time of transit.

Example III.—Required the time of high water at New York, October 1, 1856. Using the United States Nautical Almanac, we find the time of moon's transit $1^h\ 24^m$, astronomical reckoning, or $1^h\ 24^m$ p. m. calendar time. From Table II, we have under the heading of New York, for $1^h\ 30^m$, (the nearest number to $1^h\ 24^m$ in the table,) $8^h\ 10^m$.

Thus to $1^h\ 24^m$, time of moon's transit,
Add 8 10 interval found from Table II.

The sum, 9 34 p. m., is the time of high water on the 1st of October, 1856.

If the sum of these numbers had exceeded twelve, the tide would have belonged to October 2d, and we must have gone back to the transit of the day before, and computed with it, to obtain the tide for October 1st.

Rule to find the height of high water.—Enter Table III, column 1, with the time of moon's transit. In the column headed with the name of the place, and marked A, will be found the rise and fall corresponding to the time of transit; in column B, the number to be added to soundings on the chart, where the soundings are given for mean low water; in column C, the number to be added to charts of which the soundings are given for low water, spring tides.

In the foregoing example (III) the time of transit being between 1 and 2 hours, we find, from Table III, the rise and fall of the tide on the 1st October, 1856, between 4.9 and 4.7; the number to be added to soundings given for mean low water 4.5 feet, (column B,) and for low water spring tides, (column C,) 4.9 feet.

Having found the time of high water, that of low water may be obtained nearly by adding the duration of the ebb from column 9, Table I. The time of the next preceding low water may be found by subtracting the duration of flood from column 8, Table I. The time of the next following high water may be found by adding the duration of both flood and ebb, and of the next preceding high water, by subtracting the same duration of the whole tide.

Example IV.—To find the next high water following that of Example III.

The duration of flood, column 8, Table I, for New York, is $6^h\ 0^m$; and of ebb from column 9, is $6^h\ 25^m$; the sum is $12^h\ 25^m$.

To $9^h\ 34^m$ p. m., October 1, the time of high water found,
Add 12 25 duration of flood and ebb.

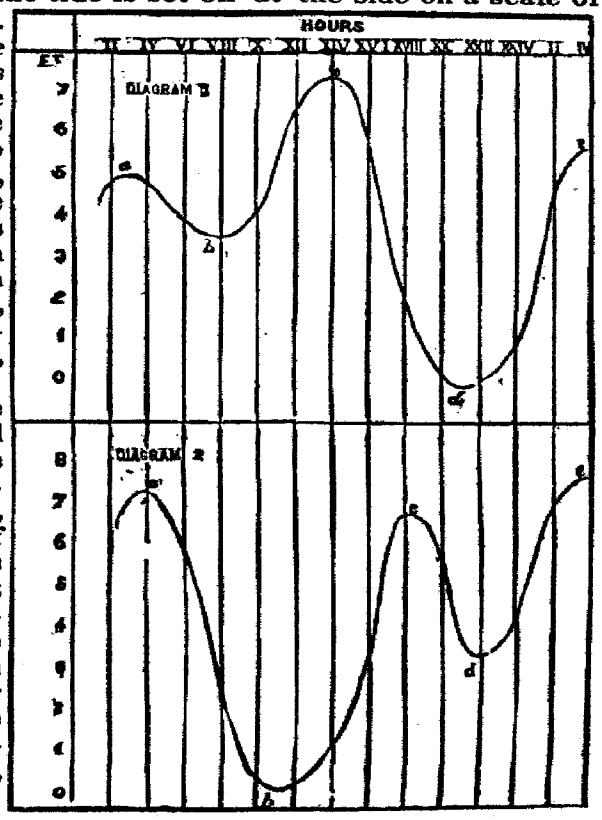
Sum, 21 59, or $9^h\ 59$, a m. of October 2, the time of the next high water.

TIDES OF THE PACIFIC COAST.

On the Pacific coast there is, as a general rule, one large and one small tide during each day, the heights of two successive high waters occurring one a. m. and the other p. m. of the same twenty-four hours, and the intervals from the next preceding transit of the moon are very different. These inequalities depend upon the moon's declination. When the moon's declination is nothing, they disappear, and when it is the greatest, either north or south, they are greatest. The inequalities for low water are not the same as for high, though they disappear and have the greatest value at nearly the same times.

When the moon's declination is north, the highest of the two high tides of the twenty-four hours occurs at San Francisco about eleven and a half hours after the moon's southing, (transit;) and when the declination is south, the lowest of the two high tides occurs at about that interval.

The lowest of the two low waters of the day, is the one which follows next the highest high water. The nature of these tides will probably appear more plainly from the annexed diagrams. In them the height of the tide is set off at the side on a scale of feet, and the hours of the day are at the top. At XII, noon, for example, the tide-gauge marked 6.7 feet. Joining all the heights observed in the twenty-four hours, we have a curve like that marked in the figure. The two high waters are *a* and *c*, and the two low waters *b* and *d*. If *a* is the high water, which occurs about twelve hours after the transit of the moon, when the declination is *south*, the ebb *a b* is quite small, and the high water *a* is much lower than the next high water *c*. If the moon's declination is *north*, it is the large high water *a* of the second diagram, which occurs next after the transit, and about twelve hours from it.



Tables IV and V give the number to be added to the time of moon's transit, to find the time of high water almost as readily as in the former case. It is one of double entry, the time of transit being, as before, placed in the first column. The number of days from the day at which the moon has had the greatest declination, are arranged at the top of the table. Entering the first column with the time of transit, until we come under the column containing the days from the greatest declination, we find the number to be added to the time of transit to give the time of high water. If the moon's declination is *south*, Table IV is to be used; if *north*, Table V.

Number to be added to the time of moon's transit at San Francisco, to give the time of high water for different times of moon's transit, and declination of the moon.

Time of Moon's transit.	TABLE IV. South Declination—Days from greatest Declination.								TABLE V. North Declination—Days from greatest Declination.								Time of moon's transit.
	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	
h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.
0 0	13 05	13 02	12 57	12 50	12 42	12 32	12 19	12 05	11 05	11 08	11 13	11 20	11 28	11 38	11 51	12 05	0 0
0 30	12 59	12 56	12 51	12 44	12 36	12 26	12 13	11 59	10 59	11 02	11 07	11 14	11 22	11 32	11 45	11 59	0 30
1 0	12 53	12 50	12 45	12 38	12 30	12 20	12 07	11 53	10 53	10 56	11 01	11 08	11 16	11 26	11 39	11 53	1 0
1 30	12 47	12 44	12 39	12 32	12 24	12 14	12 01	11 47	10 47	10 50	10 55	11 02	11 10	11 20	11 33	11 47	1 30
2 0	12 41	12 38	12 33	12 26	12 18	12 08	11 55	11 41	10 41	10 44	10 49	10 56	11 04	11 14	11 27	11 41	2 0
2 30	12 36	12 33	12 28	12 21	12 13	12 03	11 50	11 36	10 36	10 39	10 44	10 51	10 59	11 09	11 22	11 36	2 30
3 0	12 33	12 30	12 25	12 18	12 10	12 00	11 47	11 33	10 33	10 36	10 41	10 48	10 56	11 06	11 19	11 33	3 0
3 30	12 33	12 30	12 25	12 18	12 10	12 00	11 47	11 33	10 33	10 36	10 41	10 48	10 56	11 06	11 19	11 33	3 30
4 0	12 38	12 35	12 30	12 23	12 15	12 05	11 52	11 38	10 38	10 41	10 46	10 53	11 01	11 11	11 24	11 38	4 0
4 30	12 46	12 43	12 38	12 31	12 23	12 13	12 00	11 46	10 46	10 49	10 54	11 01	11 09	11 19	11 32	11 46	4 30
5 0	12 55	12 52	12 47	12 40	12 32	12 22	12 09	11 55	10 55	10 58	11 03	11 10	11 18	11 28	11 41	11 55	5 0
5 30	13 03	13 0	12 55	12 48	12 40	12 30	12 17	12 03	11 03	11 06	11 11	11 18	11 26	11 36	11 49	12 03	5 30
6 0	13 11	13 08	13 03	12 56	12 48	12 38	12 25	12 11	11 11	11 14	11 19	11 26	11 34	11 44	11 57	12 11	6 0
6 30	13 16	13 13	13 08	13 01	12 53	12 43	12 30	12 16	11 16	11 19	11 24	11 31	11 39	11 49	12 02	12 16	6 30
7 0	13 23	13 20	13 15	13 08	13 00	12 50	12 37	12 23	11 23	11 26	11 31	11 38	11 46	11 56	12 09	12 23	7 0
7 30	13 29	13 26	13 21	13 14	13 06	12 56	12 43	12 29	11 29	11 32	11 37	11 44	11 52	12 02	12 15	12 29	7 30
8 0	13 34	13 31	13 26	13 19	13 11	13 01	12 48	12 34	11 34	11 37	11 42	11 49	11 57	12 07	12 20	12 34	8 0
8 30	13 37	13 34	13 29	13 22	13 14	13 04	12 51	12 37	11 37	11 40	11 45	11 52	12 00	12 10	12 23	12 37	8 30
9 0	13 36	13 33	13 28	13 21	13 13	13 03	12 50	12 36	11 36	11 39	11 44	11 51	11 59	12 09	12 22	12 36	9 0
9 30	13 34	13 31	13 26	13 19	13 11	13 01	12 48	12 34	11 34	11 37	11 42	11 49	11 57	12 07	12 20	12 34	9 30
10 0	13 30	13 27	13 22	13 15	13 07	12 57	12 44	12 30	11 30	11 33	11 38	11 45	11 53	12 03	12 16	12 30	10 0
10 30	13 24	13 21	13 16	13 09	13 01	12 51	12 38	12 24	11 24	11 27	11 32	11 39	11 47	11 57	12 10	12 24	10 30
11 0	13 17	13 14	13 09	13 02	12 54	12 44	12 31	12 17	11 17	11 20	11 25	11 32	11 40	11 50	12 03	12 17	11 0
11 30	13 09	13 06	13 01	12 54	12 46	12 36	12 23	12 09	11 09	11 12	11 17	11 24	11 32	11 42	11 55	12 09	11 30

If we disregard the daily inequality, the column headed San Francisco, in Table II, would give us, as in the examples on the Atlantic coast, the means of determining the time of high water. With this, the column for seven days in the present table agrees, as in between six and seven days from the maximum the declination becomes nothing, and the diurnal inequality also nothing.

Example V.—Required the time of high water at North Beach, San Francisco, California, on the 7th of February, 1853.

1st. The time of the moon's transit at Greenwich, from the Nautical Almanac, is $11^h\ 41^m$; the longitude of San Francisco $8^h\ 10^m$; requiring a correction of 16^m to the time of transit for San Francisco, which is thus found to be $11^h\ 57^m$.

2d. The moon's declination is south, and at the time of transit about two days from the greatest. Entering Table IV, we find 12^h (or 0^h) of transit, the nearest number to $11^h\ 57^m$, which the table gives; and following the line horizontally until we come to two days from the greatest declination, we find $12^h\ 57^m$.

To $11^h\ 57^m$, time of transit of moon, February 7, San Francisco,
Add 12 57 from column 0^h transit, and two days from greatest declination.

The sum is 24 54 or $0^h\ 54^m$, February 8th, is the time of high water, corresponding to the transit which we took of February 7. If we desire the tide of February 7, we must go back to the moon's transit of the 6th. The example was purposely assumed to show this case.

11^h 1^m time of transit February 6, 1853.
13 14 number for 11^h transit, and one day from greatest declination.

Sum 24 15 time of high water $0^h\ 15^m$, a. m., February 7.

The height of high water.—The height of high water is obtained in a similar manner, by the use of Tables VI and VII, entering these in the same way with the time of transit and days from the greatest declination. Table VI is for south declination, and Table VII for north.

Tables showing the numbers to be added to the soundings on charts, referred to the mean lowest low waters of day, to give the depth at high water at San Francisco.

TABLE VI.

Time of moon's transit.	SOUTH DECLINATION. Days from greatest Declination.							
	0	1	2	3	4	5	6	7
H.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
0	4.0	4.1	4.1	4.2	4.3	4.5	4.8	5.0
1	3.9	4.0	4.0	4.1	4.2	4.4	4.7	4.9
2	3.8	3.9	3.9	4.0	4.1	4.3	4.6	4.8
3	3.6	3.7	3.7	3.8	3.9	4.1	4·4	4.6
4	3.4	3.5	3.5	3.6	3.7	3.9	4.2	4.4
5	3.3	3.4	3.4	3·5	3.6	3.8	4.1	4.3
6	3.3	3.4	3.4	3·5	3.6	3.8	4.1	4.3
7	3.4	3.5	3.5	3.6	3.7	3.9	4.2	4.4
8	3.5	3.6	3.6	3.7	3.8	4.0	4.3	4.5
9	3.7	3.8	3.8	3.9	4.0	4.2	4.5	4.7
10	3.9	4.0	4.0	4.1	4.2	4.4	4.7	4.9
11	4.1	4.2	4.2	4.3	4.4	4.6	4.9	5.1

TABLE VII.

Time of moon's transit.	NORTH DECLINATION. Days from greatest Declination.							
	0	1	2	3	4	5	6	7
H.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
0	6.0	5.9	5.9	5.8	5.7	5.5	5.2	5.0
1	5.9	5.8	5.8	5.7	5.6	5.4	5.1	4.9
2	5.8	5.7	5.7	5.6	5.5	5.3	5.0	4.8
3	5.6	5.5	5.5	5.4	5.3	5.1	4.8	4.6
4	5.4	5.3	5.3	5.2	5.1	4.9	4.6	4.4
5	5.3	5.2	5.2	5.1	5.0	4.8	4.5	4.3
6	5.3	5.2	5.2	5.1	5.0	4.8	4.5	4.3
7	5.4	5.3	5.3	5.2	5.1	4.9	4.6	4.4
8	5.5	5.4	5.4	5.3	5.2	5.0	4.7	4.5
9	5.7	5.6	5.6	5.5	5.4	5.2	4.9	4.7
10	5.9	5.8	5.8	5.7	5.6	5.4	5.1	4.9
11	6.1	6.0	6.0	5.9	5.8	5.6	5.3	5.1

NOTE.—To use these Tables with a chart on which the soundings are referred to mean low water, subtract one foot from the numbers in the tables.

Example VI.—In Example V, to obtain the height of the tide on February 7, the declination being south, we enter Table VI with 0^h of transit, and two days from greatest declination, and find that the tide will be 4.1 feet above the mean of lowest low water, or that 4.1 feet are to be added to the soundings of a chart reduced to the mean of the lowest low waters of each day. If the soundings of the chart were given for mean low water, then 1.0 foot ought to be subtracted from the numbers in Tables VI and VII; thus, in this example it would be 3.1 feet.

The approximate time of the successive low and high waters of the day will be found by adding the numbers in Table VIII to the time of the first high water already determined. The table gives the numbers for the different days from the greatest declination.

TABLE VIII.

Containing numbers to be added to the time of high water found from Table III, to obtain the successive low and high waters.

Days from greatest declination.	SOUTH DECLINATION.			NORTH DECLINATION.			Days from greatest declination.
	Low water. (Small.)	High water. (Large.)	Low water. (Large.)	Low water. (Large.)	High water. (Small.)	Low water. (Small.)	
	h. m.	*h. m.*	*h. m.*	*h. m.*	*h. m.*	*h. m.*	
0	4 11	10 24	17 52	7 28	14 26	18 37	0
1	4 17	10 31	17 55	7 24	14 19	18 36	1
2	4 23	10 41	17 58	7 17	14 09	18 32	2
3	4 33	10 55	18 02	7 07	13 55	18 28	3
4	4 45	11 11	18 06	6 55	13 39	18 24	4
5	5 03	11 31	18 08	6 37	13 19	18 22	5
6	5 23	11 58	18 13	6 15	12 52	18 15	6
7	5 49	12 25	18 14	5 49	12 25	18 14	7

The days from greatest declination are written in the first and last columns of the table. The second, third, and fourth columns refer to south declination, and the fifth, sixth, and seventh, to north. The second column gives the number which is to be add l, according to the declination, to the time of high water obtained by means of Tables IV and V, to give the next low water, which is the small low water *b* of Diagram I. The third contains the numbers to be added to the same, to give the second or large high water *c* of Diagram I. The fourth, the numbers to be added to to the same, to give the second or large low water *d* of Diagram I. The succeeding columns give the numbers to be used in the same way for north declinations, to obtain the low water *b* (large) of Diagram II, the high water *c*, (small,) and the low water *d*, (small,) of the same diagram.

The rise and fall of the same successive tides may be obtained by inspection, from Table IX, in which the first column, at the side, contains the time of transit, and the successive columns the numbers corresponding to that time, and to the number of days from greatest declination. The arrangement of this table is like that already given.

The numbers for the small ebb tide *a b* of Diagram I, or *c d* of Diagram II, are first given; then those for small low and large high water *b c* of Diagram I, and *d e* of Diagram II; next, the large ebb tide *c d* of Diagram I, or *a b* of Diagram II; and lastly, from the large low water to the small high water *d e* of Diagram I, or *b c* of Diagram II.

TABLE IX.

Showing the rise and fall of the several tides corresponding to different hours of transit and days from greatest declination of moon at San Francisco.

Hours of moon's transit.	Small ebb tide, or from small high water to small low water.								From small low water to large high water.								Large ebb tide, or from large high water to large low water.								From large low water to small high water.								Hours of moon's transit.
	Days from maximum declination.								Days from maximum declination.								Days from maximum declination.								Days from maximum declination.								
	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	
H.	Feet.	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	H.
0	1.4	1.6	1.7	2.1	2.5	3.0	3.7	4.3	3.4	3.4	3.5	3.7	3.9	4.0	4.1	4.3	7.2	7.0	6.9	6.5	6.1	5.6	4.9	4.3	5.2	5.2	5.1	4.9	4.7	4.6	4.5	4.3	0
1	1.2	1.4	1.5	1.9	2.3	2.8	3.5	4.1	3.2	3.2	3.3	3.5	3.7	3.8	3.9	4.1	7.0	6.8	6.7	6.3	5.9	5.4	4.7	4.1	5.0	5.0	4.9	4.7	4.5	4.4	4.3	4.1	1
2	1.0	1.2	1.3	1.7	2.1	2.6	3.3	3.9	3.0	3.0	3.1	3.3	3.5	3.6	3.7	3.9	6.8	6.6	6.5	6.1	5.7	5.2	4.5	3.9	4.8	4.8	4.7	4.5	4.3	4.2	4.1	3.9	2
3	0.7	0.9	1.0	1.4	1.8	2.3	3.0	3.6	2.7	2.7	2.8	3.0	3.2	3.3	3.4	3.6	6.5	6.3	6.2	5.8	5.4	4.9	4.2	3.6	4.5	4.5	4.4	4.2	4.0	3.9	3.8	3.6	3
4	0.2	0.4	0.5	0.9	1.3	1.8	2.5	3.1	2.2	2.2	2.3	2.5	2.7	2.8	2.9	3.1	6.0	5.8	5.7	5.3	4.9	4.4	3.7	3.1	4.0	4.0	3.9	3.7	3.5	3.4	3.3	3.1	4
5	0.0	0.2	0.3	0.7	1.1	1.6	2.3	2.9	2.0	2.0	2.1	2.3	2.5	2.6	2.7	2.9	5.8	5.6	5.5	5.1	4.7	4.2	3.5	2.9	3.8	3.8	3.7	3.5	3.3	3.2	3.1	2.9	5
6	0.1	0.3	0.4	0.8	1.2	1.7	2.4	3.0	1.9	1.9	2.0	2.2	2.4	2.5	2.6	2.8	5.7	5.5	5.4	5.0	4.6	4.1	3.4	2.8	3.7	3.7	3.6	3.4	3.2	3.1	3.0	2.8	6
7	0.2	0.4	0.5	0.9	1.3	1.8	2.5	3.1	2.2	2.2	2.3	2.5	2.7	2.8	2.9	3.1	6.0	5.8	5.7	5.3	4.9	4.4	3.7	3.1	4.0	4.0	3.9	3.7	3.5	3.4	3.3	3.1	7
8	0.5	0.7	0.8	1.2	1.6	2.1	2.8	3.4	2.5	2.5	2.6	2.8	3.0	3.1	3.2	3.4	6.3	6.1	6.0	5.6	5.2	4.7	4.0	3.4	4.3	4.3	4.2	4.0	3.8	3.7	3.6	3.4	8
9	0.9	1.1	1.2	1.6	2.0	2.5	3.2	3.8	2.9	2.9	3.0	3.2	3.4	3.5	3.6	3.8	6.7	6.5	6.4	6.0	5.6	5.1	4.4	3.8	4.7	4.7	4.6	4.4	4.2	4.1	4.0	3.8	9
10	1.2	1.4	1.5	1.9	2.3	2.8	3.5	4.1	3.2	3.2	3.3	3.5	3.7	3.8	3.9	4.1	7.0	6.8	6.7	6.3	5.9	5.4	4.7	4.1	5.0	5.0	4.9	4.7	4.5	4.4	4.3	4.1	10
11	1.5	1.7	1.8	2.2	2.6	3.1	3.8	4.4	3.5	3.5	3.6	3.8	4.0	4.1	4.2	4.4	7.3	7.1	7.0	6.6	6.2	5.7	5.0	4.4	5.3	5.3	5.2	5.0	4.8	4.7	4.6	4.4	11
	From.....*a* to *b*, Diagram I. And from....*c* to *d*, " II.								From.....*b* to *c*, Diagram I. And from....*d* to *e*, " II.								From.....*c* to *d*, Diagram I. And from....*a* to *b*, " II.								From.....*d* to *e*, Diagram I. And from....*b* to *c*, " II.								

Example VII.—Thus in Example VI, the high water of February 7th was found to be 3.1 feet above mean low water. The declination being south, Diagram I applies, and this high water is the small one. To obtain the fall of the next low water, or small low water, we enter Table IX with 0^h of moon's transit, and two days from greatest declination in the first part of the table, and find 1.7 feet, which will be the difference in height of this high and low water. Entering with the same transit and day in the second part, we find 3.5 feet, which is the rise of the large high water above the small low water; the difference between 1.7 foot and 3.5 feet, or 1.8 foot, is the difference of height of the two successive high waters.

It is easy to see how, in this way, the soundings of a chart can be reduced to what they would be approximately at all the successive high and low waters. A similar set of tables is in preparation for Key West, and some of the other ports on the Gulf of Mexico, where the tides are of the same character.

The tidal observations now in progress on the Pacific will give the means of extending the tables to all the principal ports there.

TIDES OF THE GULF OF MEXICO.

On the coast of Florida, from Cape Florida round the Peninsula to St. Marks, the tides are of the ordinary kind, but with a daily inequality, which, small at Cape Florida, goes increasing as we proceed westward to the Tortugas.

From the Tortugas to St. Marks, the daily inequality is large and sensibly the same, giving the tides a great resemblance to those of the Pacific coast, though the rise and fall is much smaller. Between St. Marks and St. George's Island, Apalachicola entrance, the tides change to the single-day class, ebbing and flowing but once in the twenty-four (lunar) hours. At St. George's Island there are two tides a day, for three or four days, about the time of the moon's declination being zero. At other times there is but one tide a day, with a long stand at high water of from 6 to 9 hours. From Cape St. Blas to, and including, the mouth of the Mississippi, the single-day tides are very regular; and the small and irregular double tides appear only for two or three days, (and frequently even not at all,) about the time of zero declination of the moon. The stand at high and low water is comparatively short, seldom exceeding an hour.

To the west of the mouth of the Mississippi the double tides reappear. At Isle Dernière they are distinct, though a little irregular, for three or four days, near the time of the moon's zero declination. At all other times the single-day type prevails, the double tides modifying it, however, in the shape of a long stand of from 6 to 10 hours at high water. This stand is shortest at the time of moon's greatest declination, sometimes being reduced to but one hour. At Calcasieu the tides are distinctly double, but with a large daily inequality. The rise and fall being small, they would often present to the ordinary observer the same appearance as at Isle Dernière. At Galveston the double tides are plainly perceptible, though small for five or six days, at the time of moon's zero declination. At other times they present the single-day type, with the peculiarity that after standing at high water for a short time, the water falls a small distance and stands again at that height for several hours, then continues to fall to low water. Sometimes it falls very slowly for nine or ten hours following high water, and then acquires a more rapid rate to low water. At Aransas Pass and Brazos Santiago the single-day tides prevail. Small, irregular double tides are only perceived for two or three days at moon's zero of declination. At other times there is but one high water in the day, with a long stand of from six to nine hours, during which there are often small irregular fluctuations or a very slow fall.

In the following table the mean rise and fall of tides at the above stations is given.

The highest high, and the lowest low, waters occur when the greatest declination of the moon happens at full or change; the least tide, when the moon's declination is nothing at the first or last quarter.

The rise and fall being so small, the times and heights are both much influenced by the winds, and are thus often rendered quite irregular.

TABLE X.

Rise and fall of tides at several stations on the Gulf of Mexico.

STATIONS.	MEAN RISE AND FALL OF TIDES.		
	Mean.	At Moon's greatest declination.	At moon's least declination.
	Feet.	*Feet.*	*Feet.*
St. George's Island, Florida	1.1	1.8	0.6
Pensacola, Florida,	1.0	1.5	0.4
Fort Morgan, Mobile Bay, Alabama	1.0	1.5	0.4
Cat Island, Mississippi	1.3	1.9	0.6
South-west Pass, Louisiana	1.1	1.4	0.5
Isle Dernière, Louisiana	1.4	2.2	0.7
Entrance to Lake Calcasieu, Louisiana	1.9	2.4	1.7
Galveston, Texas	1.1	1.6	0.8
Aransas Pass, Texas	1.1	1.8	0.6
Brazos Santiago, Texas	0.9	1.2	0.5

TO DETERMINE THE RISE AND FALL OF THE TIDE FOR ANY GIVEN TIME FROM HIGH OR LOW WATER.

It is sometimes desirable to know how far the tide will rise in a given time from low water, or fall in a given time from high water, or to approximate to the time which has elapsed from low or high water, by knowing the rise or fall of the tide in the interval.

If the proportion of the rise and fall in a given time were the same in the different ports, this would easily be shown in a single table, giving the proportional rise and fall, which by referring to Table I, showing the rise and fall of the tide at the port, would give the rise and fall in feet and decimals. The proportion, however, is not the same in different ports, nor in the same ports for tides of different heights. The following, Table XI, shows the relation between the heights above low water for each half hour, for New York and for Old Point Comfort, and for spring and neap tides at each place. Units express the total rise of high water above low water, and the figures opposite to each half hour denote the proportional fall of the tide from high water onward to low water. For example, at New York, three hours after high water, a spring tide has fallen six-tenths (sixty hundredths) of the whole fall. Suppose the whole rise and fall of that day to be 5.4 feet, (Table I,) then three hours after high water the tide will have fallen 3.24 feet, or three feet three inches nearly. Conversely, if we have observed that a spring tide has fallen three feet three inches, we may know that high water has passed about three hours.

TABLE XI.

Giving the height of the tide above low water for every half hour before or after high water, the total range being taken as equal to 1.

Time before or after high water.	NEW YORK.		OLD POINT COMFORT.	
	Spring tide.	Neap tide.	Spirng tide.	Neap tide.
h. m.				
0 0	1.00	1.00	1.00	1.00
0 30	0.98	0.98	0.98	0.98
1 0	0.94	0.93	0.95	0.94
1 30	0.89	0.86	0.88	0.87
2 0	0.80	0.72	0.80	0.78
2 30	0.72	0.59	0.70	0.68
3 0	0.60	0.45	0.59	0.57
3 30	0.49	0.31	0.49	0.44
4 0	0.39	0.19	0.37	0.34
4 30	0.28	0.10	0.26	0.22
5 0	0.18	0.02	0.17	0.13
5 30	0.09	0.00	0.08	0.05
6 0	0.05	....	0.03	0.01
6 30	0.00	....	0.00	0.00

TIDES IN COASTING.

By observing the times of high and low water along the coast, we find the places at which they are the same. The map shows that it is high water nearly at the same hour all along our coast from Sandy Hook to Cape Canaveral; of course not in the bays and harbors and up the rivers, but on the outer coast. It is high water exactly at the same hour all along the line marked XII seen on the chart near Sandy Hook, and north and south of Hatteras, and, with small interruptions, at Cape Lookout and Cape Fear, all the way to near Cape Canaveral. This same line extends eastward to near Block Island and south of Nantucket, and then passes away from our coast. At full and change of the moon, along this line (approximately) it is high water at XII o'clock Greenwich time, the local time of high water depending upon the longitude of the place; or, to speak more correctly, in the average of a lunar month, it is high water so many hours after the time of the moon's passing the meridian of Greenwich.

By these lines, called cotidal lines, we can determine what tidal currents the navigator must expect to meet in coasting, and for this purpose we divide the ports of the coast into two sets, those south and those north of New York.

The sailing lines of coasters bound to southern ports this side of the Straits of Florida are marked upon the map, and also of those bound through the sounds to eastern ports and outside to Halifax and European ports.

Vessels to and from ports South of New York.

South of Sandy Hook, New York, the line of XII hours is nowhere more than 18 miles from the coast, that of XI¾ nowhere more than 35 miles, that of XI½ nowhere more than 48, and of XI nowhere more than 110 miles. The distances of these lines of XII to XI hours (corresponding, within four minutes, to VII and VI of New York time) from different parts of the coast is shown in Table A, where the first column gives the name of the place, and the second, third, fourth, and fifth, respectively, the distances of the cotidal lines of XII, XI¾, XI½, XI hours. The distances are measured from the ports on perpendiculars to the cotidal lines. They may be taken as if measured on the parallel of latitude at all the points for the line of XII hours, and at all between Sandy Hook and Cape Hatteras, for the lines of XI¾ and XI½ hours.

(A)

NAMES OF LOCATIONS.	DISTANCE FROM COAST, MEASURED ON PERPENDICULAR TO COTIDAL LINES.			
	At XII hours.	At XI¾ hours	At XI½ hours.	At XI hours.
	Naut. miles.	Naut. miles.	Naut. miles.	Naut. miles.
Sandy Hook	12	32	53	100
Barnegat	2	29	39	78
Cape May	15	30	46	92
Cape Henlopen	18	33	47	92
Assateague	7	22	36	82
Cape Henry	12	28	43	100
Cape Hatteras	.....	8	20	63
Ocracoke Inlet	.....	11	26	71
Cape Lookout	.....	7	18	56
Beaufort Entrance	6	15	24	63
Cape Fear	.....	6	16	55
Cape Roman	.....	10	21	67
Charleston Light	3	15	27	70
Port Royal Entrance	5	17	29	78
Tybee Entrance	6	17	31	82
St. Mary's Entrance	12	25	40	110
St. John's Entrance	17	35	48	
Cape Canaveral	16			
Cape Florida				

The cotidal lines are in such directions that at 10, 20, and 30 miles from the coast, between Sandy Hook and the St. John's, there is but a variation of seven minutes, and even to Cape Canaveral only of eight minutes. Keeping ten miles from the shore, the coaster would pass from XII hours at Sandy Hook to XI hours 45 minutes at Hatteras, and increase again irregularly to XII hours 7 minutes at the St. Johns, as shown more explicitly in the Table B. These three tracks of 10, 20, and 30 miles are inside of the cold wall of the Gulf Stream, and generally in the cold current, except at Cape Canaveral.

(B)

NAMES OF STATIONS.	COTIDAL HOUR AT 10, 20, AND 30 NAUTICAL MILES FROM THE COAST, PERPENDICULAR TO THE COAST.					
	10 miles off.		20 miles off.		30 miles off.	
	Hours.		Hours.		Hours.	
Sandy Hook	12	0	11	52	11	45
Barnegat	11	52	11	44	11	35
Cape May	12	5	11	53	11	45
Cape Henlopen	12	7	11	57	11	48
Assateague	12	0	11	48	11	37
Cape Henry	12	5	11	48	11	42
Cape Hatteras	11	45	11	30	11	22
Ocracoke Inlet	11	47	11	36	11	25
Cape Lookout	11	45	11	30	11	20
Beaufort Entrance	11	55	11	38	11	25
Cape Fear	11	38	11	25	11	18
Cape Roman	11	45	11	33	11	24
Charleston Light	11	52	11	38	11	25
Port Royal Entrance	11	57	11	45	11	32
Tybee Entrance	11	55	11	43	11	30
St. Mary's Entrance	12	8	11	57	11	47
St. John's Entrance	12	7	11	57	11	50
Cape Canaveral	12	8				
Cape Florida	13	10				

It follows, then, as a general thing, from these two tables, that the coaster, in passing from Sandy Hook to the St. John's, would have the tides the same within some fifteen minutes as if he remained at Sandy Hook. So that leaving, for example, at high water, he would, according to the elapsed time, have the ebb and flood alternating every six hours and a quarter nearly, as if he had remained near Sandy Hook. As the flood tide sets in generally to the northward and on shore and the ebb tide to the southward and off shore, he would know by the time that elapsed from his departure and the period of the tide at which he started, what tidal currents he might expect to meet as he passed along the coast. This of course is not peculiar to Sandy Hook as a point of departure, but would be true for any of the entrances given in the table, taking care not to mistake the times of tides within for that at the entrance.

By referring to George W. Blunt, Esq., I have obtained the tracks of sailing and steam vessels passing from New York to ports to the south of it, as shown by the lines on the chart accompanying this paper. Tracing these on the map of cotidal lines, I have determined how the navigator would find the tides as he passes from port to port. The results are shown in the annexed Table, (C) in which the port between which and Sandy Hook the mariner passes is at the head of the table, and at the side the place off which the cotidal hours will be found, as stated in the table.

(C)

OFF	COTIDAL HOURS ON SAILING LINES BETWEEN NEW YORK AND (*Measured on parallel of latitude of the places named in first column.*)							
	Delaware Bay.	Chesapeake Bay.	Ocracoke Inlet.	Cape Fear.	Charleston.	Savannah.	St. John's.	Cape Florida.
	Hours.	Hours.	Hours.	Hours.	Hours.	Hours.	Hours.	Hours.
Sandy Hook	12 5	12 5	12 5	12 5	12 5	12 5	12 5	12 5
Barnegat	11 57	11 57	11 57	11 57	11 57	11 57	11 57	11 57
Cape May	12 10	11 52	11 45	11 45	11 45	11 45	11 45	11 45
Cape Henlopen	.....	11 51	11 43	11 43	11 43	11 43	11 43	11 43
Assateague	.....	11 55	11 33	11 33	11 33	11 33	11 33	11 33
Cape Henry	.....	12 13	11 24	11 24	11 24	11 24	11 24	11 24
Cape Hatteras	.....	.....	11 48	11 48	11 48	11 48	11 48	11 48
Ocracoke Inlet	.....	.....	.....	11 42	11 42	11 42	11 42	11 42
Cape Lookout	.....	.....	.....	11 39	11 39	11 39	11 32	11 24
Beaufort Entrance	.....	.....	.....	11 39	11 39	11 39	11 32	11 24
Cape Fear	.....	.....	.....	.....	11 36	11 36	11 24	11 0
Cape Roman	.....	.....	.....	.....	11 46	11 46	11 19	
Charleston Light	.....	.....	.....	.....	.....	11 52	11 18	
Port Royal Entrance	.....	.....	.....	.....	.....	12 3	11 18	
Tybee Entrance	.....	.....	.....	.....	.....	.....	11 16	
St. Mary's Entrance	.....	.....	.....	.....	.....	.....	11 55	
St. John's Entrance	.....	.....	.....	.....	.....	.....	12 10	
Cape Canaveral								
Cape Florida								

Thus from Sandy Hook to Delaware Bay, starting with XII hours 5 minutes, off Barnegat there would be at the same instant XI hours 57 minutes, and off Cape May XII hours 10 minutes; so the navigator would have the same succession of tides whether he remained at Sandy Hook or passed onward to Delaware Bay, or whether he came from Delaware Bay to Sandy Hook. So from Sandy Hook to Charleston, he would find, *at the same instant*, XII hours 5 minutes at Sandy Hook, XI hours 57 minutes off Barnegat, XI hours 45 minutes off Cape May, and so onward upon the parallels of latitude for the several points. *For all practical purposes, then, of coasting, the succession of the tides, and of course of the tidal currents of flood and ebb, will be the same as if the navigator remained stationary.* Leaving at low water, he will meet the flood for 6 hours and 15 minutes, and then the ebb for another 6 hours and 15 minutes, and so on. It is the simplest of all rules that has thus come out of this investigation.

That remarkable change of temperature between the waters of the in shore cold current and of the warm waters of the Gulf Stream, (occurring in so short a distance that Lieut. Bache called it the "cold wall,") takes place at distances off the coast of from 170 to 29 miles, (see Table D,) between Sandy Hook and Cape Canaveral, mea-

sured from the several points named in the table at right angles to the direction of the course, or measured along the parallels of latitude of the points at distances from 195 to 28 miles between Assateague and Cape Canaveral. (Table D.) The points where the parallels north of Assateague meet this division line have not been accurately determined.

The annexed Table (D) shows these distances measured at right angles and on the parallel.

(D)

Distance from coast to "cold wall" of Gulf Stream off	Measured at right angles to coast.	Measured on parallel of latitude.
	Naut. Miles.	Naut. Miles.
Sandy Hook	170	
Barnegat	135	
Cape May	137	
Cape Henlopen	137	
Assateague	95	195
Cape Henry	92	107
Cape Hatteras	30	31
Ocracoke Inlet	53	52
Cape Lookout	53	65
Beaufort Entrance	62	
Cape Fear	54	97
Cape Roman	57	103
Charleston Light	61	95
Port Royal Entrance	79	97
Tybee Entrance	79	95
St. Mary's	90	87
St. John's	85	82
Cape Canaveral	29	28
Cape Florida		

The coasting line of thirty miles keeps inside of the cold wall all the way to Canaveral, and all the routes traced on the chart from Sandy Hook to southern ports are inside of it.

The Gulf Stream lines drawn on the chart show how the route to Bermuda and to the Bahamas cuts the alternate bands of warm and cold water of the Gulf Stream.

Vessels to and from ports East of New York.

The Plate shows the sailing lines of vessels bound from New York to eastern ports and to Halifax, outside. The annexed table (E) gives the Greenwich times of high water off the several points named in the first column on the routes to and from the places named in the heading of the table. The distances are measured at right angles to the cotidal curves.

(E)

OFF	COTIDAL HOURS ON SAILING LINES BETWEEN NEW YORK AND						
	Newport.	N. Bedford.	Nantucket.	Boston.	Portsm'th.	Portland.	Halifax.
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.
Sandy Hook	.....	.....	.....	.....	.....	.....	12 5
Throg's Point	16 16	16 16	16 16	16 16	16 16	16 16	
Fisher's Island	13 48	13 48	13 48	13 48	13 48	13 48	
Block Island	12 16	12 16	12 16	12 16	12 16	12 16	11 30
Monomoy	.....	.....	.....	16 10	16 10	16 10	
Cape Cod	.....	.....	.....	14 35	14 35	14 35	12 15
Cape Ann	.....	.....	.....	.....	15 0	14 40	
Portland	.....	.....	.....	.....	.....	15 30	

In passing from New York to an eastern port, the first great change in the tides and tidal currents is between the East River and Long Island Sound; the difference between Governor's Island and Negro Point, on Ward's Island, at the eastern entrance to Hell Gate, is 2 hours and 45 minutes. Between this point and Throg's Point the change is small. The mariner is now in the full tide of the Sound, and between Throg's Point and Fisher's Island there is a difference of time of but 2 hours and 20 minutes, the greatest part of which is at the head of the Sound and at its entrance, that is, near Throg's Point and Fisher's Island. From off New London to off Sands' Point, the difference is but 1 hour and 40 minutes. So that if the mariner, instead of remaining at Throg's Point, passed onward to Fisher's Island, he would lose but half a tide in the whole passage. In other words, he would have the same succession of rise and fall, according to the time elapsed, whether stationary or passing onward within two hours and a half, or less than half a tide. The tidal current lines show that even a less allowance is to be made for the change of current than for the change of tide, the difference in the change of currrent between Throg's Point and Fisher's Island along the middle of the Sound being of no practical significance. Passing out of Long Island Sound, the tidal hours grow earlier, until off Block Island that of Sandy Hook is again reached.

The cotidal line of Sandy Hook and Block Island being the same, it is the struggle of the same tide through New York Bay and the narrow East River and obstructed Hell Gate, and through Fisher's Island and Long Island Sounds and to Throg's Point. The tidal currents meet near Throg's Point.

The lower part of Narragansett Bay has the cotidal hour XII hours nearly. Buzzard's Bay has nearly the same cotidal hour, the tide-wave reaching the shores at nearly the same time all around the bay. It would be impossible to give, in a small compass, a minute account of the tides of Martha's Vineyard and Nantucket Sounds. In general, it may be said that as far as Holmes' Hole and Wood's Hole, they resemble those of Block Island Sound, and afterwards those of Monomoy, at the Eastern entrance; but this generalization is unsatisfactory without more details than there is space here to give. In these Sounds takes place the remarkable change of between three and four hours, the great change of our coast, dislocating, as it were, the times of high water at places south and west and east and north of Nantucket. The whole of this change takes place between the eastern entrance of Nantucket Sound and the western of Martha's Vineyard, giving rise to quite a complex condition of both tides and currents, which it has occupied much time to unravel.

The dominant cotidal line of our coast, from Block Island to Cape Canaveral, is that of XII hours of Greenwich time; that of our eastern coast, from Nantucket to Passamaquoddy, is in general XV hours. Passing out of Nantucket Sound, coasters carry nearly the same cotidal hour to Cape Cod, and thence vary their time about half an hour in passing to Boston, to Portsmouth, to Portland, or to Passamaquoddy. It has long been known that the tidal almanac for Boston might practically be used for eastern ports. Vessels from New York to Halifax, (and New York to Europe,) which keep outside, and should keep well off the Nantucket Shoals, and off George's, as shown by the track on the chart, vary their cotidal hour but little, keeping between the lines of XII and of XI½ until quite well on their course and beyond Cape Sable. The same rule will apply to their case as has been given for vessels between New York and a southern port.

COAST OF LABRADOR,

FROM YORK POINT TO SANDWICH HARBOR.

Variation allowed from York Point to Sandwich Harbor 2¾ and 3 Points.

YORK, or CHATEAUX BAY, lies about 16 miles N.W. ¾ N. from the South-western point of Belle Isle, and 8 leagues N. ¾ 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. *York, or Chateaux Bay.*

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 of 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 3½ 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 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 Southeasterly winds to be much frequented.

CAPE CHARLES.—To the North-eastward of St. Peter's Islands 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. ¼ 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. ¼ E., distant 14 miles; between them lies Niger Sound, an inlet about 2 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.*

CAPE CHARLES HARBOR.—From the North point of Cape Charles Island into Cape Charles Harbor, the course is N.W. ¾ N., distant 4 miles; this harbor is formed by Eyre and Little Caribou Islands, on the Eastern side, and by the main on the West: there is a 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. *Cape Charles Harbor.*

From Cape Charles Island to the Battle Islands, the course is E.N.E. ¼ N., and the distance 4½ 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. ¼ 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 the 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. ¾ S. distant one mile; in this harbor there is good anchorage for small vessels. *Cutter Harbor.*

St. Lewis River.

ST. LEWIS RIVER.—From the Northernmost Battle Island, to the entrance of the River St. Lewis, the course is N.N.W. ¾ W., distant 7 miles; steer in N.W. ¼ W. 5 miles, then N.N.W. ½ 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.

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 port 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.

DEER HARBOR.—From the Northernmost Battle Island, to the entrance of Deer Harbor, the course is N.N.W. ½ N., distant 2¾ 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.

CAPE ST. LEWIS.—From the Northernmost Battle Island to Cape St. Lewis the course is N. ¼ 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. ¼ W. half a mile; it is commonly called Deep Water Creek, being very narrow, and having from 20 to 40 fathoms within it. About 1½ mile N.N.W. ¾ 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.

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. ¾ E. distant 1½ 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. ½ N., distant 2¼ miles; and from Cape Lewis to Cape Spear, in nearly the same direction, 6½ 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 island close on board, there being 4 fathomsa longside 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 island will be shut in with the land, so as not to be seen until you get within the heads.

Sophia, Charlotte, and Mecklenburgh Harbors.

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. ¼ 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 eitherside 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.

SOPHIA HARBOR.—The first and Southernmost of these three harbors is Sophia Harbor, running in S.S.W. about 1¼ 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.

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.

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 port 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.

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 in 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; everywhere 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.

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 in 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.

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 the 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.

FISHING SHIP HARBOR.—From St. Francis Island to the Northernmost Fishing Island, the course is N.N.E. ¾ N., distant 3 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. GILBERT'S RIVER.—Between Fishing Island 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. 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. 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 lands always sets right into or out of the harbor.

St. Michael's Bay. 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 towards 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. 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. 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. EAGLE COVE lies on the South side of Hawke Island; this place affords good riding for large ships in 30 or 40 fathoms of water, and also for smaller vessels in 7 and 8 fathoms at the upper end of the bay.

Caplin 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. 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 a 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 nine 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. *Seal Islands.*

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 port 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. *Shallow 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. *Sandy Bay.*

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. *Spotted Island.*

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. *Sand Hill Cove.*

TABLE BAY.—The Southern head of this bay lies about two 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. *Table Bay.*

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. *The Gannets.*

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 1¼ mile N. by W. from Green Island. Small vessels run higher up the bay, and *Curlew Harbor.*

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. 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 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. 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 Islands is over a sandy flat, 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 South-westward, and is bounded to the Northward by the North River Flats, and to the South 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 8 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.—It now is (1850) 2½ *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.

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.

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 into a place within the island, called St. Modeste Bay, and anchor; but this, though occasionally used, cannot be recommended.

Wolf's Cove, or L'anse de Loup.

WOLF'S COVE, OR L'ANSE DE LOUP.—S.W. by S. 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.

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.

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 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. 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. 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 the 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 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. 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. 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. 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. CUMBERLAND HARBOR lies N.N.E. ¾ N. about 3 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. 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 to 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. *Port and River St. Augustine.*

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. *River St. Augustine.*

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. *Eagle Harbor.*

This part of the coast is very dangerous for any vessel 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 2 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. *Ha Ha Bay.*

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. *Little Fish Harbor.*

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 at 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 a peak, which may serve as a landmark to point out either of these places of anchorage.

Great Mecatina Island. GREAT MECATINA ISLAND lies three 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 around 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. MECATINA HARBOR.—This harbor is formed behind Mecatina Island on the main; it is safe but small, yet will admit vessels of burden, 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 1 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. 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. BAY DE PORTAGE.—N.W. by N. from the Murr Islands, distant 2 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.	2¼	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.

From Fox Islands to St. Augustine's Chain	E. by N.	15 miles.
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 do.
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 Rocks, 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. ⅕ 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. ¼ 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. ⅕ E.	4	do.
——— to Round Island, Ha Ha Bay	N.N.W. ½ N.	6½	do.
——— to Treble Hill Island	E. ¾ S.	3⅓	do.
——— to Double Hill Islands	N.N.E.	5½	do.
——— to Goose Islands	N.E. ¾ N.	5½	do.
——— to Fox Islands	N.E. ⅕ 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 which 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.

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.

Great Bank of Newfoundland.

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.

Outer, or False Bank.

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 10 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 the 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 driven 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 or 50 fathoms water, and others will be met with further out to seaward, at the distance

* 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.

of 125 or 130 leagues from the land. Fortunately, these formidable 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 met with sometimes every month in the year. 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 46° and 48° 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.

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 100 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 the 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 violently as to make it unsafe to pass in a gale. Lat. 46° 26′ 15″ N., Long. 50° 57′ 30″ W.

A Shoal.

A SHOAL of 21 feet is said to have been found by Capt. Ryder, of Provincetown, Mass., in lat. 46° 30″. It is a rock between one and two hundred feet surface, about 50 miles East of the Virgin Rocks.—See the Chart.

EAST COAST OF NEWFOUNDLAND,

FROM CAPE RACE TO ST. JOHN'S HARBOR.

Variation, 24° West.

Cape Race.

CAPE RACE is the S.E. point of Newfoundland. It is table land, moderately high. Near it is a black rock, and several smaller ones around it.

Fixed light. There is a fixed white light on Cape Race ; it will be visible to seaward from N.E. by E. round by the S.E., and South to West. The light is elevated 180 feet above mean water level of the sea, and may be seen in clear weather 17 miles from a ship's deck. The tower is striped red and white vertically. It stands close to the old beacon, which has been reduced in height The light-house is in lat. 46° 39′ 12″ N., long. 53° 2′ 38″ W.

On Cape Race there is a beacon, painted white ; the ground on which it stands is 140 feet above the sea.

Beacon. 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. 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. One mile and three-quarters to the Northward of these lies Renowes Island, situated near the main land, and about one mile to the Southward of the entrance of Renowes Harbor, which is but an indifferent place of shelter, with a depth of water 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. 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 land-locked 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 Fermose Harbor, about one mile N.E. by E. is Bald Head. N. by E. from which, one mile further, is Black Head.

Aquafort. 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. 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 North-east 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. 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 two 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 port 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. *Cape Broyle Harbor.*

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

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 quarter 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. *Whittle Bay.*

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. *Bay of Bulls.*

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 of 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 time of revolution one minute. *Light.*

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 block-house 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. *St. John's Harbor.* *Light.*

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 Flag-staff open to the Northward of Frederick's Battery Flag-staff; you will by these means avoid the Prosser, a rock on the port 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 Rock, 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.

Vessels bound into St. John's at night can have a pilot by hoisting a light at the yard-arm.

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 hay-cock, standing upon Cuckold's Head; while St. John's Harbor may be distinguished by Fort Amherst, which appears white; and by the Flag-staffs 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. 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. 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 safely 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. 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. 5¾ leagues; this is an extensive and deep bay, running to the South-westward, and comprehending many lesser bays and inlets.

Belle Isle. 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 Lanse 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 9½ fathoms of water. Two miles S. by W.

from Lanse 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 Holyrood 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 Holyrood 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. *Salmon Cove.*

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. *Collier's Bay.*

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. *Brigus Bay.*

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 two or three 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. Sheep's, 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 Bay.*

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 Roberts Bay, which is 1½ mile broad, and runs into 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. *Bay Roberts.*

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. *Spaniard's Bay.*

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 Briant'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, on one of which, a mile from the main land, there is a fixed light; 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 *Harbor Grace. Light.*

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 towards 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 island 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. 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 everywhere.

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. 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. 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 Southwestward; 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. *Trinity Bay.*

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. *New Perlican.*

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 port hand. *Heart's Content.*

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. *Dildo Harbor.*

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 *Bay of Bulls.*

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 shoalest 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' 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. 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 circuitous. 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 towards the South; 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 two 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. 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. Three 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 Sound E.N.E. ½ E., distant 5 miles. To the Northwestward 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 port 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. 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. ½ 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. 4¼ 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 where 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 port 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 towards 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. *Trinity Harbor.*

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 port 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 undisturbed until the weather becomes clear and open.

There are several other anchoring places in this harbor, with good clean ground. The bottom everywhere 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. *Robinhood's Bay.*

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. *Salmon Cove and English Harbor.*

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. *English Harbor.*

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 becomes 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. *Ragged 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 are the Brandy Rocks, a ledge over which the sea frequently *Catalina Harbor.*

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 near 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. 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, 4⅕ 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 may be found on the rocks.

From the South to the North head of Catalina the course is N.E. ¾ E., distant 5¼ 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 2½ 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 as far as Cape L'Argent.

From Flower's Point to Cape L'Argent is 3¾ 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 1½ 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 1 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. CAPE BONAVISTA is in latitude 48° 42′ N., and longitude 53° 08′ W. On it there is a revolving light of two minutes intervals, showing a red and white light alternately. It is 150 feet above the level of the sea. Kept open with Spiller's Point, t keeps vessels clear of the rocks called the Flowers.

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. ½ E., distant 3½ 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. At its Northern extremity are 10 fathoms water, and a little further off 45 fathoms. Between the

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

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 Old 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.

BONAVISTA BAY.—This extensive bay is formed on the South by Cape Bonavista, and on the North by Cape Freels. These capes lie N. ¾ E. and S. ¾ 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 ironbound; 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, 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.

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 each 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 port 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 sunken 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 Green Island is a 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 of 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. 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. 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 budren.

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. 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. 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. 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 two miles from Kate Harbor Head.

Bacon-Bone Rock. 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. 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. 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 Eastern-most 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.

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 port side of the channel. Having passed the Eastern island, stand boldly in, approaching each side as nearly as you like, and anchor anywhere 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 of 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.

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.

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.

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.

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.

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.

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 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. 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.

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 port side.

Minchin's Cove.

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: there 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 widening 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 Harbor. 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 Gooseberry Rock, towards Barrow Harbor, will be S.W. ¼ W. 18 miles. Gooseberry 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 Harbor is higher than the neighboring shores, and, consequently, may be the more readily recognized by its projection.

Sandy Cove.

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.

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. *North Broad Cove.*

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. *Salvage Bay.*

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. ¾ 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. ½ S. from Ship Island 5½ 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. *Damnable Harbor.*

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 distant; 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's Island; you may then steer directly for the cove, which you can enter without fearing any obstructions, and anchor in any part thereof, in 25 to 5 fathoms; but the Western side of the cove is to be preferred. *Morris's Cove.*

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 channel, running from Fair and False Bay, and Morris's 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 Gooesberry Island. Other channels branch off to the Northward from Bloody and Cottel's Reaches, and between the Lakeman's Islands, running into Pitt'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. *Bay of Fair and False.*

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

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. ¾ 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. ¾ 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. ¼ 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. ½ N. from the islands, distant about 2½ 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. ¼ 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 1½ 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. ¼ 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 you 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. ½ W., then shape your course W.N.W. for Indian Bay.

New Harbor. NEW HARBOR is situated on the Eastern side of Indian Bay, about two miles from the Shoe Cove Point. This place, during the 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. 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. 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 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 vessels 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. *Greenspond Tickle.*

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 water 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. *Cape Freels.*

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. *Funk Island.*

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. ¾ E., distant 10 or 16 miles from Little Fogo Islands. *Durel's Ledge.*

N.N.W. ½ W. from Cape Freels, distant 6½ 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. ¼ W., distant 14 and 15 miles. Between them the passage is clear, with from 5½ 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 6½ 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 fath- *Ragged Harbor.*

oms; 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 3½, 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. 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 Peckfords'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. ½ N. 1½ 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 4½ miles, is Copper Island. Green Island lies W.N.W. ¼ N., 2½ miles from Peckford's Island, and about a similar distance S.S.E. ½ 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. S.W. ROCK.—This is a small detached rock above water, bearing from Peckford's Island S.S.E. ¼ E., distant 3¼ 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. ¼ 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. 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. 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 Rag's 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 & Cox's Flag-staff 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 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. 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 Seal 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. 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 firewood, 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 Gull Island or the table land. *Toulinquet Harbor.*

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. *Fortune Harbor.*

TRITON HARBOR, (Great Triton Island.)—The entrance to this harbor is between the Great and Little Denier Islands. In entering you will see Francis Island, which has a reef running to the South-westward. Give this a berth; but both the Denier Islands are bold to and free from danger. Little Denier Island lies S.W. three miles and a quarter from Sculpin Rocks; on approaching which, the harbor opens off the high land of Great Denier. 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. *Triton Harbor.*

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. *Cutwell Harbor.*

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. *The Island of Toulinquet.*

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 would 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. *Cape St. John.*

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 an- *La Scie.*

chor anywhere 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 ground; but further in the ground is not good.

Great and Little Round Harbors. 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. NIPPER'S HARBOR.—This Harbor lies to the North-eastward of Green Bay Isl- and 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. 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 port 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 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.

Horse Islands. THE HORSE ISLANDS are situated nearly equidistant between Partridge Point and Cape St. John, bearing from the latter N. by W. and N.N.W., distant about 5 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 Easternmost; 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. 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. WHITE BAY.—This is a large and extensive arm of the sea, being at its entrance, from Cape Partridge to Cat Head, full four 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. *Lobster Harbor.*

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 te heads; but there is also good anchorage in any part below this, and before you have 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. *The Southward Arm.*

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 port 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. *Middle Arm.*

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. *Westward Arm.*

PURWICK COVE.—About five 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 conveniencies for the fisheries. *Purwick Cove.*

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, in 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 Heart's Coves, in which the fisheries are carried on, although ships generally anchor in the upper part of the arm, and within side 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. *Jackson's Arm.*

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. *Little and Great Coney Arms.*

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. *Great and Little Cat Arms.*

Little Harbor Deep. 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'Anse Union. GRANDFATHER'S COVE, or L'ANSE 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. 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 3 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.

Fouchée. 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. 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. 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. 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 keep on your port 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.

Englée Harbor. 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. 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. *Cape Rouge Harbor.*

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. *Belle Isle.*

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 midway; the Southern one is commonly called Red Island. They are both steep to, and without any known danger. *Groais Island.*

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, 10t 8, and 5 fathoms, and two rocks above water at the head of the bay, near which is a little rivulet of fresh water. *Croque Harbor.*

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 and Little St. Julien.*

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 South-westward of Cremallire, and has a rivulet which extends Eastward to Goose Cove. *Cremallire and Goose Coves.*

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

ST. ANTHONY'S HARBOR.—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 *St. Anthony's Harbor.*

its Southern shore. It is well supplied with wood and water, and is commonly frequented by some French fishing-vessels.

Braha Harbor. 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. 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 anchorages 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. 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 Island Harbor. GRIGUET BAY and CAMEL'S ISLAND 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. Camel's Island Harbor will always be found too intricate for a stranger, and should never be attempted without the assistance of a pilot.

The North Harbor. 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 passage narrow; the best and safest entrance is 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, everywhere good anchorage, and well sheltered from all winds. The two islands of Griguet lie outside of Camel's Island, and together form between them several small but snug harbors for fishing vessels.

White Islands. 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. 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 Degrat is visible, in clear weather, full 12 leagues to seaward.

Little Quirpon. 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. 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. 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 of the harbor, where there are some shoals which must be left on your port 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 everywhere 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 passage 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.

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.

GULL ROCK and MARIA' SLEDGE.—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. S.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, 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.

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.

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.

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 port 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.

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.

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 Bald 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 Bateaux 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 Northward part of this island is said to lie in about the latitude of 51° 57′ N.

Soundings in the Strait of Belle Isle.

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 twenty 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. Light and Beacon. *See p.* 14.

CAPE RACE, on which there is a light-house and beacon, 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 Mew 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 fath-

oms just within it. Vessels making this part of the coast may know their approach towards 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 p. 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 2 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.

TREPASSEY HARBOR.—The entrance to this harbor is to the Eastward 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 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.

Cape Pi light.

CAPE PINE.—On this cape there is a light-house 302 feet above the level of the sea. The tower is 50 feet high, painted red and white alternately. The light is revolving; time of revolution 30 seconds.

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.

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.

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.

From 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.

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' 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' 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. MAL BAY, on the E.N.E. branch, is about one mile wide, and runs up 2½ 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. 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. 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 two 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. 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. 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. 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. N.N.W. three miles from the North Point of the cape, there is a rock of 18 feet water. 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 22, 25, and 19 fathoms water; and near the Cape are 13, 14, and 15 fathoms. Vessels there-

fore 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 coast, 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. *Placentia Bay.*

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 1½ 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 it souter 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 eight 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 two 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. *Placentia Harbor.*

N.E. ½ E. from Point Verde, distant two miles, and N.N.W. from Moll Point, about ¼ 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. *Little Placentia Harbor.*

Ship Harbor. SHIP HARBOR.—From Point Latina to Ship Harbor the course and distance is E. nearly 7 miles. This inlet runs up Northerly two miles and three-quarters, and is half a mile wide. The best anchorage is in a cove on the W. side, in 10 fathoms water, about one mile from the entrance.

Fox Island. FOX ISLAND is small and round, and lies N. E. ½ N., distant three miles from Point Latina, and N.W. by W. full three 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 breakers 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 Fishing Rock, a steep rock always above water; and N.N.E., one mile and a half from Fishing Rock, is Rowland's Sunken Rock, over which the sea most commonly breaks.

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

Little South Harbor. 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. 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. 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 3 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. 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 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 to the Northward full 5 miles; but the water is shallow and unfit for shipping. From Piper's Hole 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 Islands 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 1 in breadth; it is high land, and at its S.Eastern part is a small cove, in which is tolerable good 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. 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 be-

tween 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. *Little Sandy Harbor.*

CLATISE HARBOR, &c.—S.W. by S. from Bell Island lie the Burgoe Islands, and further 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. *Clatise Harbor.*

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. *Grammer's 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 port side 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. Shoals also extend 12 miles S.S.W. of Merasheen Island. *Merasheen 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. *Red Island.*

LONG ISLAND.—Directly N. E. from Red Island, distant 7 miles, lies the main body of Long Island, and midway 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. *Long Island.*

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. *Harbor Buffet.*

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 port. The harbor is nearly two miles long and one 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 Northeastward of Long Island, called the Bread and Butter Islands; but these are always visible and steep to. *Muscle Harbor.*

Presque. PRESQUE.—W.N.W. ¾ N., distant 4 miles from the South-western point of Merasheen Island, lies the little Island 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. 2 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. 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 port 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 nine fathoms; but vessels must never attempt going between Fox Island and the main.

Paradise Sound. PARADISE SOUND.—To the Westward of Fox Island about one 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. 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. 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 further up in 6 or 7 fathoms.

Great Gallows Harbor. 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. 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. 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. 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 the 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. *Red Harbor.*

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 until 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 off the green point on the South shore, which is covered at high water. *Audierne Island.*

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. *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. *Cape Jude or Middle Island.*

West 3½ 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. *Rock Harbor.*

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 port hand at the entrance, a berth of one cable's length. *Mortier Bay.*

LITTLE MORTIER BAY.—Two miles and a half from the entrance of Mortier Bay lies Crony Point and Islands. About two 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 port 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. *Little Mortier Bay.*

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. 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. ¾ of a mile from which is Galloping Andrews; and S.E. by E. from Iron Island is the White Horse of 8 fathoms. A West S.W. course from Marticot's Island will clear all these dangers.

Great and Little Burin Harbors. 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. 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's 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. 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 port 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. 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. 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-quarters flood; and 1¾ 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, two 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 N.N.E. and S.E.

Corbin Harbor. 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, and 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. 2½ miles; and from Small Point to Sauker Head, W. ½ S. 2 miles. There are many headlands 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,) 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. *Little St. Lawrence.*

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. ½ 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 anywhere 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. *Great St. Lawrence.*

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 harbor of St. Lawrence. *Ferryland Head.*

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 Bay of Laun. Here are two small islets, called Great and Little Laun. Little Laun, 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 fathoms, 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 Bay.*

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. *Laun Islands.*

TAYLOR'S BAY lies open to the sea, about 4 miles to the Westward of Laun Islands. Off the East point are some rocks, near a quarter of a mile from the shore. *Taylor's Bay.*

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. ¾ W. 6½ leagues: there are 14 fathoms close to the off side 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 rocks and islands about it. The river at the bottom of the bay abounds with salmon. *Point Aux Gaul.*

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 daytime, 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. 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 West side of Dog Island, and will admit ships of any burden, 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 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.

Light-house. On Cannon Point, the North side of the entrance to the inner harbor, there is a light-house 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. ½ N., about two cables' length distant, there is anchorage in 5½ and 6 fathoms water.

Light-house. A fixed light of the second class, 210 feet high, is on Gallantry Head, the South side of the Island of St. Peter.

Signals. A system of signals during fog has just been adopted at St. Pierre and Miquelon, at the light-house at the Point de Gallantry. For the future, from 1st April to 1st November, in each year, there will be fired at the said light-house, at St. Pierre and Miquelon, during thick fog, two guns every two hours, at intervals of three minutes between each, from 6 o'clock in the morning, until 6 o'clock in the evening.

Independently of these regular signals, gun for gun will be returned to vessels that may be desirous of ascertaining their position by these means.

Island of Columbier. THE ISLAND OF COLUMBIER 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 Columbier; and about one quarter of a mile E.N.E. of it is a sunken rock, with 2 fathoms on it.

Green Island. 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 1¼ mile to the W.S.W.

Langley, or Little Miquelon. LANGLEY, or LITTLE MIQUELON.—Langley Island lies to the N.W. of St. Pierre, with a passage of about 2½ 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. 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, 1¼ 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. ½ E., about 4½ 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 everywhere 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 1½ 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 Dantzic 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. ½ 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. *Fortune Bay.*

BRUNET ISLAND.—The island of Brunet lies nearly in the middle of the entrance into Fortune Bay; it is above 5 miles in length, 2 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. *Brunet Island.*

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 further off, and bears from Cape Miquelon, E. ½ S. 3¾ 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. *Sagona Island.*

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. *Point May.*

DANTZIC COVES.—N. by E. 1¾ of a mile from Point May, is Little Dantzic Cove, and 2 miles further 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., 2¼ leagues; and thence to the town of Fortune, 1½ 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. *Dantzic Coves.*

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. *Ship Cove.*

From the Cape of the Grand Bank to the Point Enragée the course is E.N.E. ¼ 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 4½ leagues from the Cape of Grand Bank; it may be known by several rocks above water, lying before it, at 2 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 anywhere 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 Jersey; 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. BAY L'ARGENT.—Seven leagues 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. 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 E.: 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 anywhere, 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. 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. 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. 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. 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. 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 the small island, which you will discover between the N.E. point of the outer island and 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. 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 the 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 2 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, 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 island you will open on a small cove, on the East side, where small vessels can anchor, but large vessels must run up 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. *Belle Harbor.*

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. *Cinq Isles Bay.*

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. *Corben Bay.*

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, and 18 or 20 fathoms. *Bande de l'Arier Bay.*

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. Jaques Island.

ST. JAQUES.—Two miles to the Westward of Bande de l'Arier is the Harbor of St. Jaques, 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. *St. Jaques.*

BLUE PINION.—About 1½ mile to the Westward of St. Jaques, is the Harbor of Blue Pinion; and a little to the Westward of that is English Cove. *Blue Pinion.*

BOXY HARBOR.—Boxy Point lies W. ¾ S., 6 miles from St. Jaques Island, and E. N.E. ½E., 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 Friar's 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. *Boxy Harbor.*

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. *Great Bay de l'Eau.*

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. *Barrysway Bay.*

HARBOR BRITON lies to the Westward of Little Barrysway, and N.N.E. ½ 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 *Harbor Briton*

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. 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; 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 Basseterre Point.

Pass Island. 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. SOUNDINGS.—In the night-time, or in dark foggy weather, the mariner should not place much dependence 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. 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 2 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. *Long Island*

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. *Galtaus Harbor.*

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. *Picarre Harbor.*

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. *Round Harbor.*

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. *Long Island Harbor.*

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 1¼ mile, 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. *Bay of Despair.*

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 Jarvis Head, and is the Northern point of the South entrance to the harbor. *Great Jarvis Harbar.*

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 Mosquito Cove, a small inlet of from 30 to 47 fathoms water. *Bonne Bay.*

W.N.W., 4 miles from Bonne Bay, is the entrance to the Bay 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 *Facheux.*

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. 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. 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. ¼ 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. 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.

François Bay. FRANCOIS BAY.—West, nearly 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. 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. 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. 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 daytime 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. 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 Islands, 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. LA HUNE BAY lies close to the Westward of Cape La Hune. It is about 2 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 in to 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 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. *La Hune Harbor.*

Four leagues N.W. ¾ 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. ½ E., 3 leagues from the Penguin Islands, and are called the Magnetic Rocks.

S. by W. ½ W., 7 miles from the entrance of Little River, and N. by W. ½ 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. ½ N., 5½ 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. *The Isles of Ramea.*

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 3 fathoms, and anchor as before directed. This harbor is very convenient for fishing vessels; in it, and also about the islands, are several places for erecting stages and drying fish, which seem to be well calculated for that purpose. *Ramea Harbor.*

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. ¾ 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. *Old Man's Bay.*

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 sunken 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 18 to 30 fathoms water, with good riding everywhere, 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. *Mosquito Harbor.*

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. 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. ¾ 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. 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. 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. 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 ragged 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. 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. 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. 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. *The Bay of Cu teau.*

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. *Grand Bruit.*

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 Colombe 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 is to the Westward of the islands, between them and Little Ireland, which lies off the East point of La Poile Bay. *Bay of Rotte.*

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 remarkable 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. *La Poile Bay.*

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 inwards 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. *Great and Little Harbors.*

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. *Gally Boy's Harbor.*

Broad Cove is about 2 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. NORTH-EAST ARM.—About 2 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., 9¼ leagues, and lies nearly 11 leagues to the Eastward of Cape Ray.

Garia Bay. 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 ships.

La Moine and La Coue Harbors. 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. 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 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.

Several 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. CONNEY AND OTTER BAYS.—Six miles to the Westward of Rose Blanche Point are 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. 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 shipping 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 entrances. 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 port 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 aux 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 3 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 Eastward of Basque is Little Bay. *Port Aux Basque.*

GRAND BAY lies about 2 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. *Grand Bay.*

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.*

CAPE RAY is the S.W. extremity of Newfoundland; the land of the cape is very remarkable; near the shore it is low, but 3 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-loaves, 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 latitude of 47° 14′ N., is said to be a bank, whereon are 70 fathoms.

Tides. 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 everywhere 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. 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. 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. 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, and 12 fathoms water. The river St. George empties itself into the head of this bay, but it is not navigable for anything 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. 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.

Bearings and Distances. 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 S. 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 distant 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. *Port-a-Port.*

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, 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 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 anywhere 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 to 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. 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 wind 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, except 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. 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 2 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 port 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. 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; W. 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 Sword 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. 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 sailing along shore between Red Island and the Bay of Islands.

Bonne Bay. 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 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.

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 of all the coast, and the ground about its environs is eminently productive.

Ingornachoix Bay.

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 Hawke's Harbor.

PORT SAUNDERS and HAWKE'S 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 port 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.

Hawke's Harbor.

HAWKE'S 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 port 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.

POINT RICH is the South-western point of a peninsula, which is almost surrounded by the sea, being everywhere 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. 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 burden, 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. 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 anywhere on the port side of the harbor, only avoiding the starboard side, for a shoal of sand and mud runs all along it.

Bay of St. John. 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 35 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 freqnented. 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. POINT FEROLLE lies N.E by E. from Point Rich, 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. 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. OLD FEROLLE.—To the Eastward of Dog Island, about five 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 at 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 anywhere along the inside of the island, and a good channel up to the N.E. end thereof. There are some little islandsl ying at the N.E. end of Ferolle Island, and on the outside are some ledges of rocks a small distance off.

Bay of St. Genevieve. BAY OF ST. GENEVIEVE.—From the North end of Ferolle Island to St. Genevieve Head, the course is E.N.E., 4½ miles, and thence to the West end of Curreal 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 aforementioned Current 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 Current 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 Current 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 aforementioned island, passing which, you should haul to the Southward, and bring St. Genevieve 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 further, 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 anchorage in most parts of the bay, but the snuggest place is in 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 W. end of Current 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 W. 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, 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 W. 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. *Bay of St. Barbe.*

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 Greenville Ledge, it is about 1½ mile E. by S., and Greenville 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. *Mistaken Cove.*

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. *Savage Cove.*

Sandy Bay lies 2 miles Eastward from Savage Cove, where small vessels may ride in 3 or 4 fathoms water, with the winds from the 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. 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 37.)

Tides. 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 Genevieve 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 the 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 Ray, the South-western point of Newfoundland, and Cape North, the North-east point of Cape Breton Island.

Ice. ICE.—Among the difficulties of 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. 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 in 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 daytime.

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 plainly be 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. WINDS.—The prevailing winds during the navigable season, are either directly up or directly down the estuary, following the course of the chains of the 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 become a N.N.W. wind at Cape Gaspé. These winds frequently blow strong for 3 or 4 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 E. 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 N. to the Eastward, but sometimes by the S. to S.E. and E. 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 wind, of considerable strength, then follow each other in quick succession and from opposite quarters.

Barometer.

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 connection 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 than in lower latitudes; and the 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 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 hulls and sails change 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 anything respecting it that shall not be liable to many exceptions. There are, however, some strongly marked cases of connection, 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 barometer 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 anything 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.

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 Island; 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 myself 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's 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.

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 decree 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 consequently 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 2 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 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 everything 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 deep-sea 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 the stream anchor anywhere in the strait, than to drive about with the tides, without knowing whither; but then a lookout must be kept for drifting icebergs.

Island of St. Paul. 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.

Light-house. 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 N. 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 Northward, 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

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

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 one 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. ¼ 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 13½ 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. fathoms, over fine sand, on the edge of the bank, off which there is no bottom with 70 N.W.; and when the same rock bears W.S.W. ¼ W., distant 13½ miles, there will be 50 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. ¼ W., distance 56 miles; and to Entry Island, N.W. by W. ¾ W., 63 miles.

Light-house

From the North Bird Rock the light-house on the S.W. point of the Island of Anticosti 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 Rosier 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.

Soundings.

Light-house. 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 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 1,100 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 Anse 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 anything 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.

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 half 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.—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 N.E. 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.

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.

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 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 West 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 Isl

and 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 inshore, 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. GRAND ENTRY HARBOR.—At the N.W. end of Coffin Island, and between it and to 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, three 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 South-west 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.—Shag Island is small and low, and of sandstone, lying about a 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.—Cape Alright bears from the Old Harry Head, S. 72° W., 16¼ 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. 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.—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. 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 seldom be seen from the reef. The cross mark is the 3 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-easternmost. Hence, keeping all those cliffs open will clear the reef to the Westward, and the North-westernmost 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 2¾ 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. ½ E., 6 miles. From this line to the shore of Amherst Island at the head of the bay, the distance is 4¼ miles. Between Red Cape and House Harbor is Cape Moule, of gray 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. *Red Cape.*

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. *Grindstone Island.*

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 3 through the sand-bars of the N.W. coast, will only admit boats at high water, and when the surf is not too high. *Amherst Island.*

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 sand-stone to seaward, in the S.E. corner of Pleasant Bay. Its entrance, between this peninsula and the sands to the Southward, is 2½ 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. *Amherst Harbor.*

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. *Pleasant Bay.*

The best and most sheltered anchorage is in 4 fathoms, with the rocky point of entrance of Amherst Harbor bearing S.W. ½ 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. ½ E. A large ship should anchor further off, and should take notice that there are only from 3 to 3½ fathoms in one part of the bay, as will be seen in the chart. The bottom is everywhere excellent for holding, and of red sandy clay. A vessel, anchored as I have recommended, will be sheltered from E.N.E. ½ E., round by the Southward and Westward to N.E. ½ 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, 2¼ miles. There is an extensive flat sandy *Sandy Hook Channel.*

shoal running out 2 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 3½ 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.—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 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 off 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 these 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 the N.W. round by North to East.

Amhers Cliffs. 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.—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. extremities 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. 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 fathom patches, more than half a mile from the shore, as will be seen in the chart.

WhiteHorse. 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 Gull 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) sub-

tend 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 3⅜ 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.*

NORTH CAPE ROCKS.—The North Cape Rocks, and 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 one 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 way. 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. *North Cape Rocks.*

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 unknown causes. *Tides and Currents.*

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. 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 sand-spit off 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 inshore, or round the points. The ebb, however, is generally the strongest stream, and its rate is increased by Westerly winds, as is that of the flood by winds from the Eastward.

Deadman Islet. 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 side 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. 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., 10⅛ 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 W. end, extends 1½ mile to the Westward; and the third, off the sandy S.W. point, 1½ mile to the Southward. No marks can be given for clearing these reefs; but the bearing 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 W. 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 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, 2½ 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.

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 night-glass, in a clear and moonlight night, from the distance of 7 or 8 miles.

The two rocks bear from each other N.N.W. ½ W. and S.S.E. ½ 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. ¼ E., distant 16¼ miles from the East point of the Magdalens; and E. ½ S., 10¾ 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.

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 everywhere 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 two or three 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 termination 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 characterized 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 lime-stone, 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.

Provision-posts. 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.*

Light-house. The light-house on the extremity of the S.W. point has been built of a very beautiful grayish-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 to exceed 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.

Light-house. 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. 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., 3¾ miles. Between the two 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.

Light-house.

Heath Point. HEATH POINT.—Heath Point is of limestone, about 10 feet high, with a super stratum 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

* 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 shipwrecked persons the way to the provision-posts. The direction-boards were placed on the following parts of the shore, as I find from Mr. Lambley's remark-book, for I have not seen them all:—1st On the West point. 4th. Four leagues South-eastward of Ellis Bay. 3rd. Ten leagues Westward of Shallow Creek. 5th 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.

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.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 nowhere extend further off than three-quarters of a mile till we come to the South Point. *Cormorant 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. *South 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 deep-sea 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 S.W. 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, inclosing 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 1¼ 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. *Salt Lake Bay.*

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 *Light-house.*

the Western extremity of the point, and forms a very conspicuous landmark. 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 3 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 S.W. 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.—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.—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.—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. Large 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 3 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 E. 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 anything but an agreeable appearance to those who may

approach this bay for the first time; but there will be no danger if the following directions 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 W. side of White Cliff on with the E. 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 comes 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.

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 deep-sea 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 grayish 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 grayish white cliffs and small bays between, brings us to Bear Head, also of grayish 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.

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 grayish 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. 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 one 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. 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. NORTH REEF.—From the Northern point of Fox Bay, which is a cliff of moderate height, another reef runs out more than 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.

Tides. 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 inshore. 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 current 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.

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.

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 follows: 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.

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 the 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.

Percé Rock.

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 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. 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. 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.

Gaspé Bay. 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 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 distant 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 Gaspé. 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 Grève, and Little Gaspé. The word Cove is, however, inappropriately applied to any part of the shore between Grande Grève 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. 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 Grande 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 of 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. *Douglas Town.*

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. *Gaspé Bay.*

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 are often 9 feet water in the entrance of this river, which is between two 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 separate the harbor, basin, and S.W. arm, from the valley of the River St. John. *Cape Haldimand.*

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. *Gaspé Harbor.*

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 the 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 run-

ning 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 distances 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 Chatté, a distance of 117 miles, will require only a brief notice, as it is free from dangers and destitute of harbors.

The mountains everywhere 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.—Cape Rozier, which is nearly 7 miles N. ½ E. from Cape Gaspé, is low, and of graywacke 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.—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.—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 one 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 familes of fishermen and farmers resided here when I visited it in 1829, and had plenty of cattle, sheep, and swine.

Great Pond

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.

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 one 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."

Chaleur Bay. CHALEUR BAY.—The magnificent Bay of Chaleur is the largest in the Gulf of St. Lawrence, being 25 miles wide, on a S.W. ½ S. line, across its entrance, from Cape Despair to Miscou Island; but the entrance is more generally considered to be at Point Maquereau, from which the North point of Miscou Island bears S.S.E., 14¾ miles. The depth of the bay, from Miscou to the entrance of the Ristigouche, is about 75 miles, and its circumference, reckoning from Cape Despair round to Miscou, is 185 miles.

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

Tides. The tides are regular within the bay, and seldom amount to the rate of one mile per hour; but outside, off its mouth, and especially on the Miscou Banks, the currents and tidal streams are so irregular, both in strength and direction, that nothing definite can be said of them; and their dangerous effects upon the course of vessels can only be guarded against by the constant use of the deep-sea lead, and attention to the soundings,

Best line of entrance. Vessels bound for the Bay of Chaleur, and approaching its entrance in a dark night or foggy weather, should not attempt to make Point Maquereau, which is so bold that there is little or no warning by the lead; but should strike soundings on the Miscou banks, which extend nearly 22 miles to the Eastward of Miscou Island. A cautious lookout should be kept for the numerous fishing-schooners which are generally riding on the banks; and the Northern edge of the latter, being followed in 30 fathoms, will safely conduct vessels past the North point of Miscou, at the distance of 4 miles, and form a sure guide up the bay. The bank of soundings off the North shore is also sufficiently wide to guide vessels everywhere within Point Maquereau; nevertheless, in a dark night and bad weather, vessels had better not approach the shore much nearer than 30 fathoms in any part of the bay to the Eastward of Carlisle Point. The soundings are generally of sand and shells on the banks, while in the central parts of the bay black and brown mud prevail, with depths between 30 and 50 fathoms. Within, or to the Westward of Carlisle Point, and the opposite Bay of Nipisighit, the depth of water decreases to less than 30 fathoms, but there is still sufficient warning everywhere by the lead, quite up to the head of the bay, as will be seen in the chart.

Soundings in Entrance.

Point Maquereau. POINT MAQUEREAU is of bold and dark-colored craggy rocks. It is also wooded, and rises to about 200 feet above the sea.

Paspebiac. PASPEBIAC, 21¾ miles W. by S. from Point Maquereau, is an excellent roadstead, and the principal fishing-establishment in the Bay of Chaleur. A triangular point of sand and shingle beach, inclosing a lagoon, extends out from the main-land to the distance of a mile, and has on its West side the extensive white buildings of the establishment of Messrs. Robin & Co., of Jersey, together with numerous huts belonging to the fishermen.

Carlisle. CARLISLE is 3½ miles to the Westward of Paspebiac, and its jail and court-house, standing on the ridge in rear of Carlisle Point, are seen from the anchorage. Carlisle Point, which is wooded, and consists of sand, bears W. by N., 3½ miles from the sandy point of Paspebiac, and the roadstead is between them, but much nearer the latter.

Paspebiac Roadstead. In this excellent and convenient anchorage vessels are sheltered from the West round by North and East to S.E.; and although it is completely open to the S.W. winds, which send in a very considerable swell, yet the ground is so good that the Jersey vessels ride here moored all through the season without accident. The best anchorage is in 6 fathoms, clay bottom, with Robin's flag-staff and Single Tree Point (the extreme to the Eastward seen over the sandy point) in one, bearing East, and the extremity of the sandy point S.E. A sandy spit extends under water rather more than half a mile to the Westward from the sandy point, and nearly as far to the Southward likewise. This assists in sheltering the roadstead, and is the only danger to be avoided in approaching it.

Sandy Spit.

In running along the land from the Eastward, the low sandy point of Paspebiac, with its white stores and numerous huts, will be seen stretching out from the main-land to the Southward. When the vessel has passed Nouvelle River, and is approaching within 2 or 3 miles of the point, observe the following directions: Keep the summit of Daniel Hill open to the Southward of Nouvelle Point until the Roman Catholic church opens to the Westward of the South extremity of the sandy point bearing N.

by E. ½ E. Then haul up for Carlisle Point, with the lead going, till the above church and Robin's flag-staff (at his Northmost large white store) come in one, bearing N.E. ½ N. Haul in now boldly for the anchorage, only taking care not to open the same church out to the Eastward of the flag-staff until Single Tree Point (the extreme to the Eastward) is well shut in behind the sandy point, when the vessel will be within the spit, and a berth may be chosen by the lead at or near the position already pointed out. There is an excellent watering-place at a stream which will be seen falling from the cliffs just to the Westward of the outlet of the lagoon. Supplies of all kinds may be obtained here, but to a limited extent. There is nothing in the way when approaching this anchorage from the Westward, but in standing out from it with a Westerly wind, and especially with a lee tide, the marks for clearing the spit to the Westward must be carefully attended to. The Roman Catholic church should not be opened out to the Eastward of Robin's flag-staff until Single Tree Point is well open to the Southward of the sandy point; nor should the vessel bear up to the Eastward of South before Daniel Hill comes open to the Southward of Nouvelle Point. *Directions.*

CASCAPEDIAC BAY, situated on the Northern side, and near the head of the Bay of Chaleur, is of very considerable extent, being 13 miles wide, and 5 or 6 deep. At its head is the Cascapediac River, a very considerable stream, but which can only be entered by boats, in consequence of the extensive shoals of sand and mud, which dry out 2 miles from its entrance, and occupy all the head of the bay. *Cascapediac Bay.*

BLACK POINT, bold and rocky, and rising to the estimated height of 400 feet above the sea, is the Eastern point of the bay, bearing from Bonaventure Point N.W. ¼ N., 16 miles. The shoals commence about 1½ mile to the Northward of Black Point, and at Indian Point, on the East side of Little River, they extend out to the Westward nearly 1¾ mile, sheltering the anchorage from S.E. winds. *Black Point.*

DUTHIE POINT, the East point of entrance of the Cascapediac River, bears N. N.W. ¾ W., 5 miles from Black Point. One mile to the Eastward of Duthie Point, and in the bay, between it and Little River, stand the church and village of Richmond. *Duthie Point.*

The anchorage, where the timber-ships moor in 3 fathoms, is off the village, with Duthie Point bearing North three-quarters of a mile, the church N.E. ¾ E., and Black Point S.E. ¾ S. Vessels may anchor further out, in 4, 5, or 6 fathoms, on the same line of bearing from the church, or to the Westward of it, but they will not then be so well sheltered from Easterly winds. *Anchorage.*

In running for this anchorage from the Eastward, observe the following directions: The marks for the South-western, or outer edge of the shoal off Indian Point, (already mentioned as sheltering the anchorage from S.E. winds,) are Red Point, a little open to the Southward of Black Point, bearing S.E. ½ E. Keep these marks, therefore, well open, as you run to the Westward, with the lead going, and go no nearer to the shoal than 5 or 4 fathoms, until the church bears N.E. by E. Then haul boldly in, steering directly for the church, until you arrive at the anchorage already pointed out. *Indian Point Shoal. Directions.*

CARLETON ROAD.—This name has been given to an excellent and capacious anchorage safe in all winds. It is situated on the West side of Tracadigash Point, which consists of sand, inclosing a shallow lagoon, capable of admitting boats, or very small craft, at high water. On the Northern shore of this lagoon stands the church and village of Carleton, the latter extending to the Westward to the shore of the bay where the sand-beach of the lagoon joins the main land. A small stream, with a bridge across it, there enters the N.W. corner of the lagoon; and one mile further to the Westward, near the commencement of the clay cliffs, another small stream will be seen, which is the watering-place. Immediately in the rear of the village the Carleton Mountain rises abruptly to the height of 1830 feet above the level of the sea—the hills of the range trending from it both to the Northward and Westward for many miles. *Carleton Road. Tracadigash Point and Lagoon. Carleton Mountain.*

Vessels may choose their berth for anchoring anywhere in from 5 to 6 fathoms, remembering that although the sandy beach of Tracadigash Point is quite bold on the West side within the spit, yet shoal water extends off the main-land to the distance of nearly half a mile. The best berth, especially in Easterly winds, is in 5½ fathoms, mud, with Tracadigash Point bearing S. by E. ½ E.; Carleton steeple, E. by S.; and the watering-place, N. by W. ½ W.

TRACADIGASH SPIT, of sand, and running out half a mile to the S.W. from the sandy point of the same name, is the only danger in the way when approaching this anchorage from the Eastward. Observe that Point Maguacha and the summit of Dalhousie Mountain in one, bearing W.N.W. ¾ W., pass the extremity of the spit in 3 fathoms. Therefore, to clear it, keep the mountain well open, or at night go no nearer than 10 or 9 fathoms. As soon as Carleton steeple comes in one with the S.W. extreme of Tracadigash Point, bearing N.E. by E., the spit will have been passed, and the vessel may haul in to the Northward, going no nearer than 7 fathoms till the *Tracadigash Spit.*

Tides. point bears to the Southward of East. The tides are weak in Carleton Roads, seldom exceeding one knot. Point Maguacha, of red sandstone cliffs, is the N.E. point of entrance of the River Ristigouche, and bears from Tracadigash Point, W. ¾ N., 6½ miles. In the N.W. corner of the bay between them is Nouvelle Basin and River, nearly dry at low water.

Ristigouche River. RISTIGOUCHE RIVER, from its entrance at Point Maguacha, to where islands, shallows, and rapids terminate the navigation for all but canoes or bateaux, is an estuary or inlet of the sea, varying in breadth, for the first 17 miles, from 1½ to 3 miles.

Campbell Town. At that distance Campbell Town is situated on the Southern or New Brunswick shore, and at the foot of a remarkable conical mountain called the Sugar-loaf.

Bathurst Harbor. BATHURST HARBOR, at the mouth of the Nipisighit, is 200 fathoms wide at the entrance between Alston and Carron Points, which are of sand, with several stores and other buildings upon them. On Carron Point, which is on the S.E. side, there are two beacons, which, if kept in one, bearing S.W. ½ S., will lead in through the narrow channel over the bar in 7 feet at low-water, or in 14 feet at high-water in the best spring-tides.

The Bar. The distance from the outside of the bar, in 3 fathoms, to the entrance of the river, is 1½ mile; and for the whole of that distance, the very narrow channel is between sandy shoals, nearly dry at low-water, and extending from either side of the river's mouth.

Inner and Outer Anchorages. In the entrance between the sandy points, or rather just outside it, there are 3 and 4 fathoms; and here the vessels usually moor to take in timber, sheltered by the bar and the sandy shoals on either side. Some of the smaller vessels load within the entrance; and some of the larger ones complete their loading outside the bar, where the anchorage, in 6 or 7 fathoms, muddy bottom, is considered safe in the summer-months, although the N.E. gales send in a heavy sea.

The Basin. Within the entrance there is an extensive and perfectly sheltered basin, nearly 3 miles long by 2 miles wide, but nearly all dry at low-water, excepting the channels of the four rivers, which, after uniting their streams below Bathurst, flow through it to the entrance, forming by their junction what is called the Main Channel. On the Eastern side of the basin there is an islet called Indian or Bathurst Island.

Bathurst Town. The town of Bathurst is well situated at the head of the basin, 2½ miles within the entrance, and on the point of land which divides the river Nipisighit from the Middle and North Rivers.

Tides. The depth of 14 feet at high water in spring tides can be carried up to the wharves of the town, and in the main channel there are several places where vessels may lie afloat and load in 14 feet at low-water. The rate of the tides in the main channel is about 2 knots, and over the bar abont 1½ knot.

Pilots. The stream sets fair in and out and over the bar. There are good pilots for this river, and no one should attempt the bar without one, excepting in case of necessity.

THE COAST OF NEW BRUNSWICK NORTH OF MIRAMICHI.

The course from the East side of Miscou Island to the beacon on Point Escumenac is S.W. by S., and the distance from the North point of Miscou to the beacon is 53 miles.

Miramichi Bay. MIRAMICHI BAY is nearly 14 miles wide from the sand-bars off Point Blackland to Point Escumenac beacon, and 6½ miles deep from that line across its mouth to the main entrance of the Miramichi, between Portage and Fox Islands.

Escumenac Point and Light. POINT ESCUMENAC, the S.E. point of Miramichi Bay, is of peat, upon a very low sandstone cliff, and is wooded with spruce-trees. On it there is a light-house of wood, painted white, and showing a fixed light 70 feet above the sea, at high-water. It is so difficult, especially for a stranger, to distinguish one point of this low coast from another, that this light-house is very useful to vessels bound to Miramichi, and making the land from sea.

Escumenac Reef. It also points out the position of the very dangerous Escumenac Reef, which extends 2 miles out to the N.E. from the light-house to the 3-fathoms mark, and 2¾ miles to 5 fathoms, at low-water. In the night-time, vessels should not stand nearer to this reef than 10 fathoms.

Miramichi Bar. THE BAR OF MIRAMICHI commences from the S.E. end of Portage Island and extends across the main entrance, and parallel to Fox Island, nearly 6 miles in a S.E. by S. direction. It consists of sand, and has not more than a foot or two of water over it in some parts, at low spring-tides. Near Portage Island there is water enough over it for small vessels, and there is a still deeper part near its S.E. end, where 13 or 14 feet could be carried over at the time of our survey; but heavy gales, doubtless, alter the disposition of the sand on this bar, although they are said not to have altered the ship channel within the memory of any of the pilots.

Mark for S. E. extreme. The S.E. extreme of the bar will be cleared by keeping the church at French Village in the centre of Fox Gully, bearing W. ½ S.; and the church in one with the high water South point of Fox Island, bearing W. by S., will lead over the S.E. end of the bar in 2¾ fathoms, but very close to 2 fathoms. The church will not be easily made out by strangers, being a

wooden building, only distinguished from the barns near it by a belfry. A Black Buoy is moored in 3 fathoms at low-water on the inner or S.W. extreme of the bar, and must therefore be left to the Eastward, or on the right, going in. About a mile N.N.W. from this black buoy there is a Red Buoy moored in the same depth of water on the Lump, which is a shoal with 2 fathoms least water on the West side of the channel. There is no passage for large vessels between the Lump and Fox Island, but there are holes with 4 fathoms water, and a channel of 2½ fathoms at low-water, which might be rendered available by buoying, if it were requisite, but which is too narrow and intricate without such assistance. In its present state, therefore, and for large vessels, the whole of this part may be considered as one shoal, extending 1¼ mile out to the Eastward, from the shore of Fox Island to the red buoy of the Lump; and thus overlapping the S.W. point of the bar, where the black buoy is placed, it renders the channel crooked and difficult. The narrowest and shallowest part of the channel, until we come to the bar of the Horse-shoe, which will be presently mentioned, is in the line from the black buoy to the S.E. end of Fox Island, being less than half a mile wide, with 3¼ fathoms at low-water in ordinary spring-tides. In heavy Easterly gales, in the fall of the year, especially during the ebb-tide, there is a dangerous and heavy-breaking sea here, which has in several instances proved fatal to vessels, rendering them unmanageable, so that they have been cast ashore on the islands.

Black Buoy.

Lump Shoal and Red Buoy.

Within the Red Buoy of the Lump, which must be left to the Westward, the channel is clear and straight, about 500 fathoms wide, and from 4 to 7 fathoms deep all the way to another Red Buoy on the same side of the channel, and moored in 4½ fathoms and 70 fathoms from the edge of the shoal. This is the Red Buoy of the Spit, a sandy shoal with only a few feet of water upon it, extending half a mile from Fox Island. The course and distance from the Red Buoy of the Lump to the Red Buoy of the Spit, is N.W. ¾ N., 3 miles. Both the Lump and Spit are steep shoals, but between them a vessel may run along, or even work on the S.W. side of the channel, in 4 or 3 fathoms by the lead. On the opposite or N.E. side of the channel the bar is extremely steep, and the leading-mark for it the Easternmost white house of Burnt Church village (on the North side of the bay) just open to the S.W. of Portage Island, bearing N.W. ¾ N., is neither certain (since another house may be built) nor readily distinguished by a stranger. The shoal of the Spit trends due West, not quite a mile, from the Red Buoy towards the North point of Fox Island, where the shoal water extends only 100 fathoms off shore. On the North point of Fox Island two small beacons will be seen on the sand-hills, the one red and the other white: these kept in one, and bearing S.E. ¾ E., lead in the deepest water, from 2¼ to 2½ fathoms, to the outer Red Buoy of the Horse-shoe.

Clear Channel.

Spit and Red Buoy.

Fox Beacons.

THE HORSE-SHOE SHOAL consists of sand and gravel, with 3 feet least water, and not more than a fathom over many parts of it. It is of great extent, being 3 miles long, North and South, and 2¼ miles wide. The N.E. extreme of the Horse-shoe is nearly joined to the shoals of Portage Island, there being only a narrow and intricate channel left, which is never used. There is a good anchorage in 4 or 5 fathoms between the Horse-shoe and the South end of Portage Island, where vessels which draw too much water to cross the inner bar, may safely anchor during the summer months. To the Southward the Horse-shoe is separated from the shoal, which connects together Fox, Egg, and Vin Islands, by the very narrow ship-channel, which in one part is only 180 fathoms wide, and 2¼ fathoms deep. This is called the Horse-shoe Bar, or Inner Bar, over which 18 feet of water can be carried in ordinary spring-tides. The South side of the Horse-shoe is marked by three Red Buoys and one Black Buoy. The outer or Easternmost buoy has been already mentioned as lying in one with the two beacons on Fox Island. The other two red buoys bear W. by S. from it, the whole three lying in a line in the space of half a mile. The black buoy lies on the S.W. extreme of the Horse-shoe, and bears S.W. by W. ½ W., two-thirds of a mile from the Westernmost red buoy. These buoys must be all left to the Northward, the best water being within the distance of half a cable from them. Near the black buoy is the usual place where vessels bound to sea anchor to wait for a wind, or for a high tide to cross the Inner Bar. The S.E. point of the Horse-shoe extends 350 fathoms further out to the Eastward than its outer red buoy; and there is moreover a patch, or mound of sand and gravel, with only 10 feet water, lying off the S.E. point of the Horse-shoe to the S.E., so as to narrow the navigable channel between it and Fox Island to a third of a mile. The use of the two small beacons on the North point of Fox Island is to enable a vessel to avoid that mound, which renders the passage of the Horse-shoe Bar so difficult for a large vessel: but I believe there is as deep, and a more direct, although a very narrow channel, to the Northward of the mound, and which would be rendered safe by placing buoys upon it, and upon the S.E. point of the Horse-shoe.

Horse-shoe Shoal.

Horse-shoe Bar and Buoys.

Horse-shoe Patch.

Horse-shoe Bar.

The stream of the tides is not strong in the open bay outside the bar of Miramichi. The flood draws in towards the entrance as into a funnel, coming both from the N.E.

Tides.

and S.E. along shore from Tabisintac, as well as from Point Escumenac. It sets fairly through the ship-channel at the rate of about 1¼ knot at the black buoy, increasing to 2 or 2½ knots in strong spring-tides between Portage and Fox Islands, where it is strongest. The principal part of the stream continues to flow Westward, in the direction of the buoys of the Horse-shoe, although some part of it flows to the Northward between that shoal and Portage Island. The ebb sets out in the opposite direction, being strongest at the buoys of the Horse-shoe, and in the entrance between Fox and Portage Islands, where in spring-tides it often attains to the rate of 2½ miles per hour, and is said to be still stronger when the waters are high in the spring of the year. The ebb sets out to the Eastward from the buoy of the Lump over the tail of the bar, and should be guarded against in light winds.

The winds affected the tides very considerably, and, together with the smallness of the rise, rendered it extremely difficult to make correct deductions from a number of observations so limited as those which we were able to obtain. The Easterly winds always make high tides, and sometimes cause the neap to be higher than the spring tides. The time of high-water on the full and change days at the S.W. end of Vin Island was observed to be at about 5¾ hours, and the pilots say that it is about 5 hours on the bar.

Miramichi Tides. The rise of an ordinary spring-tide is 5 feet, and of neap-tides 3 feet; but the rise is at all times so uncertain that we have observed neap-tides which did not rise above a foot, and spring-tides not above 2 feet. It must also be remarked that the A. M. tides rose higher, in general, by 2 feet, than the P. M. tides, in the beginning of August, when alone we had an opportunity of observing them.

Miramichi Bar. Pilots. The Bar of Miramichi should never be attempted by a large vessel, or by persons not thoroughly acquainted with it, without a Branch Pilot, if one can be procured.

THE COAST OF NEW BRUNSWICK FROM POINT ESCUMENAC TO BAY VERTE INCLUSIVE.

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

Light.

From Point Sapin to Richibucto Head, the course is S. ¾ W., and distance nearly 20 miles across.

Richibucto River. RICHIBUCTO RIVER is of very superior importance to those which have just been described: being, among the rivers on this side of New Brunswick, inferior only to the Miramichi, either in the distance to which it is navigable, or in the depth of water over its bar. It is annually visited by a considerable number of vessels for cargoes of lumber.

Richibucto Bar very dangerous. THE BAR of the RICHIBUCTO is extremely dangerous, especially to large deeply-laden and dull-sailing vessels outward bound, in the fall of the year. Taking advantage of the highest spring-tide, and sailing at high-water, if the wind becomes unsteady or too high, they are almost certain to be thrown ashore by the ebb-tide, on the South-eastern part of the bar; and should a N.E. gale occur, to be destroyed before they can be got off again. To take a ship in with a leading wind and flowing tide, is attended with no other difficulty than that which arises from the narrowness of the channel; but in all cases the assistance of a pilot is absolutely necessary, since the bar is subject to occasional changes from the effect of heavy gales. We found the branch pilots of Richibucto able, intelligent, and attentive to their duties: They keep a good lookout for vessels from the beacon, at the mouth of the river. The bar extends from the North beach for 2 miles to the E.S.E., parallel to the South beach; there is a rock in the Eastern part of it, but the remainder is of sand, dry at low-water. No part of this bar extends to seaward so much as a mile from the shore, and it may be safely approached by the lead to 6 fathoms, at any time of the tide; but for the purpose of anchorage 9 fathoms is a better depth, the bottom being there of fine brown and gray sand, affording far better holding-ground than further inshore. The situation of the narrow channel over this bar (1½ mile E.S.E. from the river's mouth.) is indicated by two white beacons on the South beach, and by a large black buoy moored off it in 3¾ or 4 fathoms at low water, with the two beacons in one, bearing (in 1839) W.S.W. ½ W., distant not quite a mile. These beacons in one always lead in over the bar, being shifted as required almost every spring, in consequence of changes in the channel effected by heavy N.E. gales. The North beacon, which stands on a sand-hill, 30 feet high, at the South extremity of the North beach, is large and

Pilot.

Anchorage without the Bar.

Bar Beacons. Bar Buoys.

white, being intended to point out the situation of the river to vessels many miles out to sea.

The depth of water over the bar is 9 feet at low-water, or 13 feet at high-water, in ordinary spring-tides. *Tides.*

The ordinary spring tides rise 4 feet, and the neap tides 2½ feet, at the North beacon. On the day of the full moon in July there was only one high-water, at 3h. 30m., A. M., and one low-water, at 4 P.M. But towards the time of neap tides, two high-waters in 24 hours become apparent for a few days. There would seem to be two interfering tides, presenting phenomena which it would require accurate and long-continued observations to explain. The rate of the tides in the river is from 1½ to 2 knots.

CAPE JOURIMAIN, the North extreme of the Jourimain Islands, forms the extreme point of land to vessels running through the Strait of Northumberland, either from the Eastward or Westward. It bears S.E. by E. ½ E., 6¼ miles from Cape Bruin; and there is good anchorage in the bay between them in 5 fathoms, sandy bottom, and in winds from the S.E. by E. round by South to W. by N. The islands are connected together, and with the main land, by sand-bars and marshes; but still they appear as islands when seen from a distance sufficient to sink the sand-bars below the horizon. *Jourimain Islands.*

THE JOURIMAIN SHOALS are extremely dangerous to vessels running at night without their leads going; they commence at Peacock Cove, off which there is a patch of 3½ fathoms, 2 miles off shore, as will be seen in the chart. They extend from Cape Jourimain 1½ mile to the N.N.W.; and there is a patch of 4 fathoms, 1¾ mile North from the same point. From their N.W. extreme they extend 4½ miles to the S.E. They are of sandstone, thinly and partially covered with sand; and their S.E. point, a narrow ridge with only 6 feet at low-water, and distant 1¾ mile from the shore, is the most dangerous, because the boldest part of the shoals. It should not be approached nearer than 9 fathoms in the night-time; but further Westward the shoals may be approached, with proper caution, to 6 fathoms at low-water. To the Southward of these shoals, and between them and the Tormentine reefs, there is very good anchorage with Westerly winds, in from 5 to 6 fathoms, the bottom being of sand, with clay underneath. *Jourimain Shoals.*

THE TORMENTINE REEFS are extremely dangerous, and are rendered doubly so by the strong tides. They extend off Indian Point rather more than 3 miles to the E.S.E., and there is rocky ground with 4 fathoms fully a mile further off shore. The part of these reefs which dries at low water is very small, and bears E.S.E. ½ E., 2¾ miles from Indian Point. It lies about 150 fathoms to the Southward of the line joining Cape Spear and the South side of Ephraim Island, and the whole of that island open to the Southward of Cape St. Laurent will clear it more than a mile to the Southward; but these marks are not of much use, nor are there any others that can be depended upon, for the North extreme of the trees of the inner Jourimain Island, and the South extreme of the trees of the outer Jourimain Island touching, which is the mark that now leads well clear of the reef to the Northward, will change as the woods are cleared away. The only sufficient guides, therefore, are the lead and the Admiralty chart. Vessels running through the strait at night, or at any time, without a commanding breeze, should not approach this reef from any direction between North and East nearer than 9 fathoms; for the flood-tide sets over it to the Southward, into the Bay Verte, at the rate of 3 knots, causing a great rippling over the part that dries, and generally indicating its position. Nearly midway between the dry part of the reef and Indian Point there is a patch of rocks with 7 feet at low water. Small craft carry a depth of 2½ fathoms at low water through between that patch and Indian Point, and often take shelter under the latter in Northerly winds: but large vessels, wishing to do the same, must run round outside the whole of the reef, and will find the soundings in the Admiralty chart a sufficient guide for the purpose. *Tormentine Reefs.*

BAY VERTE is 9 miles wide across its entrance, from Indian Point in New Brunswick, to Coldspring Head in Nova Scotia, but contracts to the breadth of 2½ miles near its head. *Bay Verte.*

THE RIVER TIGNISH is the most considerable stream in the Bay Verte, which it enters on the South side near its head. It has only 3 feet depth of water, in a very narrow channel, when the tide is out: and it is approached by a narrow channel, from 3 to 7 feet deep, through flats of mud and weeds, which dry out a mile from its mouth. *Tignish River.*

There are thriving settlements on either side of the Bay Verte.

SPEAR SHOAL has a patch of rocks with 10 feet least water near its East end, and from 15 to 18 feet in other parts; it is a bank of sand and stones, resting on sandstone, about a mile long, in an East and West direction, and a third of a mile broad. From the shoalest part Cape Spear bears N.W. by N., 1¾ mile, and Indian Point N. N.E., 2¼ miles. The lead gives little warning in approaching this dangerous shoal from the Eastward, on which side there are from 3¾ to 4¼ fathoms close to it; but *Spear Shoal.*

vessels will avoid it by coming into no less water than 4½ fathoms, as they pass it to the Southward. There are 3¼ fathoms of water between it and Cape Spear.

Heart Shoal. About a mile W.N.W. from Spear Shoal, and S.W. by S. 1¼ mile from Cape Spear, there is Heart Shoal, with 9 feet least water, and 15 feet between it and the shore, but as it lies within the 3-fathoms mark, it will be sufficient to refer to the chart, in addition to having pointed out its position.

Laurent Shoal. LAURENT SHOAL, of rock and sand, with 16 feet least water, is about three-quarters of a mile long by half that breadth. On the shoalest part Cape St. Laurent bears N.W. by N., 2½ miles, Ephraim Island N.W. ½ W., Indian Point N.E. by E. ¼ E., and Coldspring Head S.S.W. ½ W. This shoal is also most bold on the East side, where there are 4¼ fathoms close to it.

Aggermore Rock. THE AGGERMORE ROCK, with 18 feet least water, and bearing N.E. ½ E., 2¾ miles from Coldspring Head, is, like Laurent Shoal, merely one of the shallowest points of an extensive rocky bank, which is thinly covered with mud and sand, and which extends out from Cape St. Laurent and Ephraim Island, in a S.E. by S. direction, so as to leave a deep channel, about 2 miles wide, between it and Coldspring Head. At low-water not more than 3½ fathoms could be safely reckoned upon, in running between the Aggermore Rock and Laurent Shoal, or between the latter and the Ephraim Banks, extending off the Northern shore; and even that depth could only be insured by the assistance of the Admiralty chart, for there are not more than 19 feet in several parts of the banks.

Ephraim Island.

Ephraim Banks.

Direction for Bay Verte. Vessels bound up the Bay Verte, should therefore keep the Nova Scotia coast on board, running up in 6¾ and 7 fathoms, till they arrive off Coldspring Head, where, at the distance of about 1¼ mile from the shore, they will find the water deepen to 8 or 9, and even nearly to 10 fathoms, as they pass to the Southward of the banks and shoals which have been described. After passing Coldspring Head about 3 miles, the depth of water decreases to less than 5 fathoms, and continues to shoal gradually, with mud and sand bottom, to the head of the bay. A reference to the chart will show the general extent of the shoal water off the shore; but the Boss Spit, which stretches three-quarters of a mile out from the South shore between Boss and Jackson Points, and 3¼ miles within, or to the N.W of Coldspring Head, is so dangerous as to require particular notice. It dries out to its edge, and is so steep to, that there is 17 feet of water close to its outer point. Vessels should be careful not to go into less water than 3¼ fathoms, until they are past this sand-spit. Further up the bay there is nothing in the way, excepting two patches of stone with 3 and 5 feet water, at the distance of half and three-quarters of a mile N.N.E. ½ E. from Tignish Head. These are perhaps ballast heaps, of which there are several at the entrance of the channel of the river; but as these are all within the 2-fathoms line, they require no further notice.

Boss Spit.

Stony Patches.

GULF OF ST. LAWRENCE—NORTHUMBERLAND STRAIT—COAST OF NOVA SCOTIA.

Eastward from the Bay Verte there is no place of use to shipping for a distance of 10 miles, or until you arrive at the contiguous rivers Philip and Pugwash, into which runs the bay between Lewis Head and Pugwash Point. The last-named point bears from the former E. by S., 2¼ miles; and there are reefs off both of them, which render the approach extremely perilous to strangers, and which, therefore, we shall first notice:

Lewis Reef. LEWIS REEF extends to the N.E., 2½ miles from Lewis Head; its outer part is composed of detached rocky patches, on which there are from 14 to 18 feet of water, with a greater depth between them; but the inner part is very shallow, and has as little as 6 feet of water at the distance of 1½ mile from the shore.

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

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

To run for Pugwash Road from the Northward, the ship being in not less than 5 fathoms, proceed as follows:—Bring the English Episcopal church steeple at Pugwash so as to be seen over and only just within the West extreme of the low cliff of Fishing Point, (the East point of the bay,) bearing S. by E. ½ E.

Run towards those marks, taking care not to open out the church in the least to the Westward of the point until Bergeman Point (the South point of entrance of the River Philip) bears S.W. by W., or until the depth decreases to 3½ fathoms at low-water. The vessel will then be close off the N.W. end of Pugwash Reef, and the course must be changed to S.S.W. for three-quarters of a mile, when she will be in from 16 to 19 feet at low-water, with clay bottom, directly in the line joining Bergeman and Pugwash Points, and with Fishing Point E. by S. ½ S., distant nearly half a mile. This is the best anchorage; but vessels may lie half a mile further in to the Southward, or close off the bar, and in 14 feet at low-water. Still further in the bay is all shoal, excepting the narrow channel which curves round its Eastern side, and leads to the harbor. To run for Pugwash Road from the Eastward, the vessel being in more than the low-water depth of 5 fathoms, bring Bergeman Point to bear S.W. by W., and steer for it until the church opens out to the Westward of Fishing Point, when immediately change the course to S.S.W., and, having run nearly three-quarters of a mile, anchor in the same berth as before directed.

Pugwash Harbor.

PUGWASH HARBOR, at the head of the bay and entrance of the river of the same name, is small, but perfectly secure, and has more than a sufficient depth of water for any ship that can pass the bar, on which the depth is 14 feet at low-water, in ordinary spring-tides. Pilots are indispensable.

Pilots.

Tides.

It is high water at Pugwash, on the full and change days, at 10h. 30m., the ordinary spring-tides rising 7 feet, and the neap tides 4 feet. The rate of the tidal streams, which is greatest in the entrance of the harbor, does not exceed 2 knots, unless it may be the ebb in the spring after the melting of the winter's snows. In the roadstead it seldom exceeds a knot.

Nine miles E.S.E. from Pugwash Point brings us to Cape Cliff, and 3 miles further S.E. to Oak Island, formerly called Fox Island.

Wallace Harbor

WALLACE HARBOR is the finest on this coast, excepting Pictou, having 16 feet over its bar at low-water, in ordinary spring tides, which rise 8 feet, so that it is capable of admitting very large ships. Its entrance, 2½ miles W.S.W. ½ W., from Oak Island, and between two sandy spits, named Palmer and Caulfield Points, is nearly 2 cables wide and 6½ fathoms deep; but the approach to this entrance, over the bar and through the bay for a distance of 3 miles, is by a crooked channel, which, although nowhere less than 160 fathoms wide, is, nevertheless, difficult without the aid of buoys or sufficient leading-marks.

Saddle Island.

SADDLE ISLAND is low, wooded, three-quarters of a mile long, in an E.S.E. ½ E. direction, and joined to the shore, from which it is distant in one part only 130 fathoms, by shoals at low-water. Its Eastern point bears S.E. by E., and is distant a long 6 miles from Oak Island.

Saddle Reef.

Wash-ball Rock.

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

Mullegash Point.

MULLEGASH POINT, the North point of Tatamagouche Bay, is one mile to the Southward of Saddle Island; shallow water extends from the one to the other, and off the point to the distance of a long half mile.

Tatamagouche Bay

TATAMAGOUCHE BAY, 2¼ miles wide at its entrance, between the last-named point and Brulé peninsula, runs in 7 miles to the Westward, affording everywhere good anchorage, over a bottom of soft mud, but with insufficient depth of water for large ships far up the bay. From 5 fathoms at the entrance the depth decreases to 3 fathoms at the distance of 1½ mile up the bay, and to 2 fathoms at 4 miles, the remainder being all shallow, and in part dry at low-water, with the exception of boat-channels leading to the basin and to Mill brook. The only detached danger in this bay is a rock with 7 feet least water, 350 fathoms off the Northern shore, and 2 miles in from Mullegash Point. Amet Island and Mullegash Point touching, and bearing E.N.E, clear it to the Southward at the distance of 120 fathoms. The extent of the shallow water off shore in other parts will be seen in the chart.

A stranger may safely approach to the low-water depth of 3 fathoms in the outer part of the bay, and to 2½ fathoms further in, but in entering should keep well over to the Northward, to avoid the Brulé shoals, which will be presently mentioned.

Tatamagouche River. TATAMAGOUCHE RIVER, in the S.W. corner of the bay, and 5 miles from its entrance, is approached by a very narrow channel through the flats, obstructed by oyster-beds, and only one foot deep at low-water, in ordinary spring-tides; nevertheless new ships of considerable burden are brought down it occasionally.

Brulé Peninsula. BRULE PENINSULA is wooded, rather low, and united to the main-land at its S. W. end by a low and marshy isthmus.

Peninsula Point. Its N.W. extreme, named Peninsula Point, bears S. ½ E. 2¼ miles from Mullegash Point, and has a reef extending from it 400 fathoms to the N.W., in great part dry at low-water, and so bold that there is little warning by the lead.

Brulé Point. BRULE POINT is 1½ mile further to the Eastward, the intermediate Northern shore of the peninsula being nearly straight, and of clay cliffs 8 or 10 feet high, the whole appearing to a vessel in the offing like a low island in the centre of Amet Sound.

Brulé Shoals. THE BRULE SHOALS extend from Brulé Point 1⅓ mile to the North. They are rocky, with very irregular soundings, and 9 feet least water not far from their outer edge. The N. and N.W. sides of these shoals should be approached very cautiously, for they are there extremely steep, having 4 or 5 fathoms close to the edge, and no good clearing-mark. On the N.E. side the English Episcopal steeple at the River John just open to the Northward of Long Point, bearing S.E. ½ E., clears them in 3 fathoms; whilst on the E. and S.E. vessels may safely approach by the lead to 3½ fathoms.

Long Point.

Brulé Harbor BRULE HARBOR runs in within the peninsula, 2¼ miles, in a W.S.W. direction, and is nearly a mile wide, but the far greater part of this large space is occupied by flats of mud and weeds. There are 14 feet on the bar at low-water, and 19 feet for a short distance within, but the channel soon becomes very narrow and divided into several branches. The anchorage outside of the bar, in 3¼ fathoms and mud bottom, is the best sheltered of any in the sound, and a ship or two usually lie there to take in lumber every year. In the best berth Brulé Point will bear N.W. by N., with the Eastern end of Saddle Island showing open one point to the right of it; Conn's large white house,* S.W. and Cape John N.E.

Anchorage.

John Bay. JOHN BAY, the next place in order to the Eastward, runs in nearly 4 miles to the S.E. from Cape John to Murphy Point, which is the sandy East point of entrance of the river. It is free from detached dangers, but the shoals extending out from its shores are often very steep, and should not be approached nearer than the low-water depth of 3½ fathoms, nor without due caution. Sandy shoals occupy the head of the bay, drying out nearly half a mile, and extending 1¼ mile from the entrance of the river to the 3-fathoms line.

John River. THE RIVER JOHN has only one foot at low-water over its bar of sand, and an irregular depth, from 3 to 11 feet, in a very narrow channel up to the bridge, a distance of nearly a mile.

Cape John. CAPE JOHN, the Northern point of John Bay, will be easily recognized by its sharp-pointed cliffs of sandstone 40 or 50 feet high; and by two high rocks, always above water, on the inner part of the reef, which extends from it 400 fathoms to the N.W. This reef is very steep, especially at its Western point, where there are nearly 7 fathoms at low-water quite close to it, being a greater depth than occurs anywhere else near. Off the Northern side of Cape John, shallow water extends nearly half a mile, and as there are only 15 or 16 feet close within the 3-fathoms mark, large vessels should not approach nearer than the low-water depth of 4 or 3½ fathoms.

Amet Sound. AMET SOUND is very extensive, affording excellent anchorage for any number and class of vessels. The places described in the last article are all within this sound, Tatamagouche Bay being its South-west, and John Bay its Eastern arm. Mullegash Point and Cape John, its Western and Eastern points of entrance, are more than 4 miles apart, but there are detached dangers outside, or off the entrance, which require to be described before directions can be given for entering by either of the three channels which they form.

Waugh Shoal. WAUGH SHOAL, from its position and steepness extremely dangerous, was not generally known before our survey. It is a rocky bank, nearly 1¼ mile long by half a mile broad, with very irregular soundings, from 3½ to 5 fathoms, excepting toward its Northern end, where there is a patch of considerable extent with from 2 to 2¾ fathoms; twelve feet being the least water, unless it may be in unusually low tides. In this shallowest part the shoal is very steep, and should not be approached from the Northward nearer than 7 fathoms, but in all other parts vessels may approach to 3 fathoms at low-water. There are no clearing-marks for the Western side of this shoal

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*Conn's House stands a short distance back from the Southern shore of the harbor, and about 50 feet above the sea: it is at present the only two-story house in that place, and has a large barn close to East of it. It bears S. by W. 1¼ mile from Brulé Point.

e lead and the bearing from the East end of Saddle Island, N.E. ¾ N., are there the ly guides. The N.E. side is just cleared in 5 and 6 fathoms, either by the Eastern xtremes of Amet Island and Cape John in one, bearing S.E. ½ S., or by the Western de of Cape John and the English Episcopal steeple at the River John in one, bearing .S.E. ¾ E. The S.E. side is cleared in 4 fathoms, by the Eastern extremes of Mulegash and Chambers Points in one, bearing S.W. ¾ S. All these objects will easily be ade out excepting Chambers Point, which, being very low, is at times difficult to disnguish from the high land behind it.

Amet Island.

AMET ISLAND is very small, covering a space of 230 fathoms East and West, ith an extreme breadth of 40 fathoms. It is divided into two parts, of which the Vestern is the largest, presenting clay cliffs on every side, excepting where they are oined together by a sandy neck. It is flat at top, bare of trees, covered with a coarse rass, and about 20 feet above the sea at high-water. It was formerly much larger an at present, and the cliffs still continue to be undermined by every heavy gale and igh tide; the frosts also aid in the work of destruction, so that the time cannot be ery distant when there will only remain a reef of the highly inclined sandstone which t present forms the base of the island, and dries out to the distance of about two cables, excepting on the Southern side where boats can generally land at all times of the tide. Shallow water extends off this island 300 fathoms to the Westward, and will be cleared in not less than 3¾ fathoms, if the English steeple at River John be not shut in behind the Western side of Cape John; but large ships should stand in only to 6 fathoms, and will take notice, that in every other direction shallow water extends from the island to far greater distances.

Amet Shoals.

THE AMET SHOALS are rocky, with very irregular soundings, and are much more extensive and dangerous than have been hitherto represented. They extend nearly 4 miles from the island to the Eastward, and also to the S.E. 2 miles towards Cape John. In both directions there are rocky patches, with no more than 5 or 6 feet, a long mile out from the island; at a greater distance than 2 miles there are not less than 16 feet, but there is a patch with that depth fully 3 miles to the Eastward of the island. The marks for this Easternmost patch are the North extremes of Amet Island and Treen Bluff in one, bearing W. ¼ N. and Cape John S.W. ½ S.

Conn's House and Cape John bearing S. W. clear it about a quarter of a mile to the S.E., and in 4 fathoms; but to clear the extreme East end of the shoal in a greater depth, Cape John must bear to the Westward of S.W. by W. The Northern side of these shoals is very steep, and should not be approached in a large ship, especially at night, to a less depth than 10 fathoms. Treen Bluff and Saddle Island touching, and bearing W. by N., pass along the Southern side in 2¾ fathoms, but if kept distinctly open will clear it in 3¼ fathoms. The dangers which have just been described form three passages into Amet Sound, all of which are wide and deep enough for the largest ships.

Western Passage.

THE WESTERN PASSAGE, between Saddle Island and Reef and the Waugh Shoal, is a mile wide, with irregular soundings, from 5 to 8½ fathoms, the lesser depth being to the Southward of Waugh Shoal, where the bottom is rocky and uneven, whilst further Westward it is of mud. The description of the dangers already given, with the bearings and leading-marks for avoiding them, will enable any vessel furnished with the Admiralty chart to safely run through this wide and clear passage with a fair wind. I shall add only the caution to beware of the East end of Saddle Reef, when hauling round it to the Southward; 6 fathoms is near enough until Treen Bluff is seen through between Saddle Island and the main, after which Mullegash Point may be rounded by the lead in any depth that may be convenient. The anchorage is everywhere good in Tatamagouche Bay, regard being had to the size of the vessel and consequent depth required; but over towards the Mullegash side will be found best sheltered from N.E. winds.

If bound to Brulé Harbor, after rounding Saddle Reef, steer for Brulé Point, or a little to the East of it, until the mark for clearing the North-east side of the Brulé Shoals, namely, the English steeple, John River a little open to the Northward of Long Point comes on; then change the course, and run towards those marks till Brulé Point bears S.W. by W., when you may haul in S. by W. or S.S.W., and run by the lead along the South-east side of the Brulé Shoals, in from 3¼ to 3½ fathoms, until you reach the position which has been pointed out as the best anchorage outside the bar. A pilot, or a previous buoying of the channel, would be necessary to take the vessel into the harbor. If bound to the anchorage off the bar of River John, it is only necessary to run up the middle of John Bay till the water shoals to 3½ fathoms, which is as near as a large ship should go, although distant 1½ mile from the rivers mouth. Vessels of less but of considerable burden lie moored in 2½ fathoms half a mile further in, for the convenience of taking in lumber. In beating through the Western Passage, the West end of Saddle Island may be approached to 5 fathoms, but 4 fathoms is near enough to its Eastern end. In the board towards Saddle Reef, take

care to tack with Treen Bluff open to the Northward of Saddle Island, and in the board to the Northward, towards Waugh Shoal, in 5 fathoms. When standing towards Amet Island, let the leading-marks for clearing the shallow water off it to the N.W. and S.W. be attended to. Within the sound, the directions and remarks already given, together with the Admiralty chart, will afford sufficient guidance.

Middle Passage. THE MIDDLE PASSAGE, between Waugh Shoal and Amet Island, is a long mile wide, from 5 fathoms to 5 fathoms on either side, clear of all danger, and from 6 to 10 fathoms deep, with sand and mud bottom. An excellent leading-mark for running through this passage with a fair wind, is Conn's House and Brulé Point in one, bearing S. by W.

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

Eastern Passage. THE EASTERN PASSAGE, between Amet Shoals and Cape John, is a long three-quarters of a mile wide, from 3 fathoms to 3 fathoms on either side, with very irregular soundings, from 3½ to 6 fathoms, and with rock, red sand, broken shells, and mud bottom.

It is difficult to carry more than 4 fathoms through at low-water. To safely take this passage from the Eastward with a fair wind, bring Cape John to bear to the Westward of S.W. by W., or bring that Cape and Brulé Point to touch, bearing S.W. by W. ¼ W., and steer for them till Treen Bluff opens to the Southward of Saddle Island, when change the course to W. ¾ S., which is for the mouth of Tatamagouche Bay, and the vessel will sail nearly through the middle of the passage. There will be no danger from the Amet Shoals, if Treen Bluff be kept open to the Southward of Saddle Island; nor yet from the shallow water off Cape John, if it be not approached nearer than 4 fathoms, or at the utmost 3½ fathoms.

These last remarks apply also to the case of a vessel beating through this passage; and in taking it from the Northward, with a scant Easterly wind, the clearing-marks for the East end of the Amet Shoals will safely guide her.

Tides. It is high water, on the full and change, days in Amet Sound, at about 10h.; and the rise is from 8 to 5 feet, according as it may be spring or neap tides. The tidal streams are very weak within the sound, setting regularly up the bays and rivers. In the Western Passage both tides in general set fairly through, the flood about W. by N., and the ebb about E. by S., at rates never exceeding 1½ knot, and usually much less. In the Middle Passage the ebb sets out to the Northward and Eastward less than a knot; and the flood to the Westward, at the same rate, over the Waugh Shoals. In the Eastern Passage the ebb sets out to E.N.E., and the flood in the opposite direction, the rates varying from a half to 1½ knot.

From Cape John to the West Gully of Caribou (15 miles S.E. by E. ½ E.) the coast is nearly straight, unbroken, and free from danger, the shoal water nowhere extending beyond one-third of a mile off shore. Cliffs of clay and sandstone, not exceeding the height of 50 feet, and in general very much lower, form the predominating feature; but there is, nevertheless, good landing for boats almost everywhere in fine weather. From the West Gully to Caribou Point, 4¼ miles further to E.S.E., the coast is formed by the Northern shore of Caribou Island, appearing from a distance like several islands; but on a nearer approach the wooded parts are found to be joined together by sand-bars. The shallow water extends off shore here to the distance of half a mile, and 5 fathoms is near enough in a large ship.

Caribou Reef. CARIBOU REEF, of large stones, which dry out to the distance of 300 fathoms from the shore, is very dangerous, the deep water approaching very near its North point and Eastern side. It stretches out from Caribou Point to the N.N.E., half a mile to the 3-fathoms, and two-thirds of a mile to the 5-fathoms line.

Doctor Island. DOCTOR ISLAND lies to the Southward of Caribou Point, forming two entrances into Caribou Harbor, of which the Northern, between two sandy spits, is 400 fathoms wide, but only 4 feet deep at low-water.

Doctor Reef. DOCTOR REEF is very dangerous, stretching out from Doctor Point to the Eastward 1¼ mile, to the depth of 3 fathoms, and showing rocks dry at low-water to the distance of half a mile.

Seal Rocks. To the Southward of this reef, and two-thirds of a mile S.E. from Doctor Point, lie the Seal Rocks, dry at low-water, and from which the shallow water, forming the bar of Caribou Harbor, extends to Logan Point, the North Point of Pictou Bay.

Caribou Harbor. CARIBOU HARBOR, between Caribou and Doctor Islands, is too difficult and dangerous to be attempted without some special object, and then a pilot should be employed.

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

CARIBOU CHANNEL has sufficient depth of water for the largest ships, and in breadth, at the narrowest part, exceeds a half or one-third of a mile, according as we conceive it to be bounded on either side by the 3-fathoms or the 5-fathoms line; but it is, nevertheless, difficult, because so crooked that no marks can lead through its whole extent. *Caribou Channel.*

The safest mode of running through this channel to the Westward, is to strike soundings in 6 or 7 fathoms on the edge of the shoal water off Doctor Island, and follow it to the N.W. until Mackenzie Head is just shut in behind Logan Point, bearing S. ¼ W. Then steer from those marks, keeping the Head just shut in, and they will lead across the deep water, and afterwards along the Western edge of the Pictou Island Bank out to sea. If the wind were strong from the S.W., with an ebb-tide, it would be preferable to keep on the weather side of the channel, in which case the edge of the shoal water off Doctor Island should be followed further to the N.W., until Logan Point is only a little open to the Eastward of Doctor Point, bearing S. ¼ E. Those points in one lead along the East side of Caribou Reef at the distance of a cable, and in 4 fathoms. Keep Logan Point a little open, and it will lead clear out to sea in not less than 4½ fathoms. The same marks and directions, taken in reverse order, will enable a vessel to take this channel from the Northward or Westward, it being only necessary to add, that she should not haul to the Eastward until the Hawks-bill is well shut in behind Caribou Point, nor open out the former again after having shut it in, until the light-house at Pictou is open to the Southward of Cole Point: the light-house and Cole Point in one, bearing S.W. by W. ¾ W., being the mark for clearing the South extreme of the Pictou Island Bank in 5 fathoms.

PICTOU ISLAND BANK extends from Pictou Island to the West and South 3¼ miles, and was supposed to reach across the whole distance of 4 miles to Caribou Point, before the channel last described was known. It is of a very irregular outline, of great extent, and of sandstone thinly covered with sand, gravel, mud, and broken shells. The depths are as irregular as the nature of the bottom, being from 2¾ to 6 fathoms, excepting on the shoals now to be mentioned. *Pictou Island Bank.*

THE MIDDLE SHOALS are a chain of rocky patches, with 11 feet least water, stretching across the Northern part of the bank 1¼ mile, in a W. by S. direction: so as to approach within half a mile of the Caribou channel on the one hand, and within 1¼ mile of the West point of Pictou Island on the other. I have little doubt that at least 3¼ fathoms at low-water can be carried through between these shoals and Pictou Island, although the very irregular soundings forbid absolute certainty. Rogers Point and West Point (Pictou Island) bearing E.S.E. ¼ E., will clear them to the Northward in 4 fathoms, but large ships had better not approach them on that side nearer than 7 fathoms. *Middle Shoals*

PICTOU ISLAND, 4¼ miles long, East and West, and 1¼ mile wide, is of clay and sandstone, rising in the central parts to the extreme height of 150 feet above the sea. It is wooded on the Northern side, but there are settlements and farms along its Southern shore. Low cliffs form its outline, with the exception of several small bays, and Rogers Point, on the South side, which is of sand, and affords the best landing for boats. *Pictou Island.*

West Point may be passed in 3 fathoms within half a mile; but on either side of the West end of the island there are rocks nearly dry at low-water, just within the 3-fathoms line, and extending to the distance of 300 fathoms off shore. The shallow water runs out occasionally to the same distance off the North shore of the island, which should not be approached nearer than 8 or 9 fathoms in the night-time. The Southern shore may be approached to 5 fathoms; but off the East point a dangerous reef, in great part dry at low-water, runs out half a mile to 3 fathoms, and nearly a mile to the 5-fathoms line. There are 9 fathoms not far off this reef, both to the Northward and Eastward; it should therefore be approached with caution at all times, but especially at night, and with a flood-tide. In most of the old charts a shoal is laid down about 4 miles to the Eastward of Pictou Island, but we have not yet been able to discover any indications of its existence. *West Point.*

On the East end of Pictou Island there is a light-house 52 feet high; it is a square white tower. The light is fixed; below it is a small red light. *Light.*

PICTOU HARBOR, in every respect the finest on the Southern shore of the gulf Eastward of Gaspé, derives additional importance from the coal-mines, valuable quarries of building-stone, and finely-settled country in its neighborhood. It is situated 5 miles to the Southward of Caribou Point, and at the bottom of a bay, which is 1¾ mile wide at its entrance, from Logan to Mackenzie Head, and 1½ mile deep. Mackenzie Head will be recognized by its sharp-pointed cliff of clay and sandstone, 40 feet high, and by its bearing nearly South from Logan Point. *Pictou Harbor.* *Coal.*

MACKENZIE SHOAL lies off the head to the N.E. by E., its outer edge being distant seven-eighths of a mile. It is a rocky bank, nearly one-third of a mile in diam- *Mackenzie Shoal.*

eter, with 16 feet least water, and with 19 or 20 feet between it and the shallow water to the Westward. Large vessels should not attempt to pass within or to the Southward and Westward of it. The marks for clearing it to the Eastward at the distance of a cable, are Caribou and Doctor Points in one, bearing N. by W. ½ W.; and the light-house in one with the Town Point at Pictou bearing West, will clear it to the Northward at the distance of 200 fathoms. The shallow water extends a long half mile out to the Northward from Mackenzie Head, and its edge in 3 fathoms, trends thence to the Westward towards the light-house, the whole bay on that side being shoal, with ridges of sand drying out to a considerable distance from the shore at low-water. In the bay, between Mackenzie Head and the light-house, and on the West side of Powell Point, is Boat Harbor, the entrance of an extensive inlet or lake, full of mud and weeds, and which boats can traverse only when the tide is in. On the opposite or Northern side reefs extend off Logan Point, to the East and South-east, a long half mile, to the line of 3 fathoms. The light-house and Cole Point in one, bearing S.W. by W. ¾ W., lead over the South-eastern extreme of these reefs in 14 feet at low-water, but vessels should not go nearer than 4 fathoms. Cole Point, which is of clay and sandstone cliff 30 feet high, and lies a short mile further in or to the S.W. from Logan Point, has also a reef stretching out to the S.E., one-third of a mile, and the shallow water continues from it Westward to the commencement of London Beach, on the North side of the entrance of the harbor.

Boat Harbor.

Cole Point.

Pictou Light-house. THE LIGHT-HOUSE, of wood, painted vertically with red and white stripes, and showing a fixed light 65 feet above the sea, stands close to the water, at the extremity of the sandy spit forming the South side of the entrance.

It is lighted when the bay is free of ice, and has below the lantern a small red light.

Pictou Bars. The distance across the harbor's mouth from the Sandy Spit to London Beach, is 220 fathoms, and 7 fathoms deep; but the channel over the inner bar is much narrower, and has besides a turn in it, which, together with the necessity of knowing exactly the set of the tides, renders a pilot indispensable in a large ship. Vessels running for the harbor must first pass the Outer Bar, which stretches from Logan Point to Mackenzie Head, and has 21 feet at low-water, over a bottom of sand. After passing this bar, the depth increases to 4, 5, and 6 fathoms in the distance of about a mile, and then suddenly decreases to 19 feet on the Inner Bar, which is also of sand, and distant about 400 fathoms from the light-house. After passing this inner bar, which is not above a long cable wide, the water continues deep to the entrance of the harbor. There is very good anchorage between the bars, although exposed to N.E. winds, and also in Pictou Road, which is outside of the outer bar, and where the depth is 5 fathoms, with clay and mud bottom. Vessels running or beating up to Pictou Roads at night, will find the soundings in the Admiralty chart sufficient guidance, when keeping the Southern shore aboard with the prevailing S.W. winds; and on the opposite side, or with Northerly winds, will have the advantage of the following excellent leading-marks: Pictou Light can readily be seen in a clear night from a distance of 12 or 14 miles, and when in one with Cole Point bearing S.W. by W. ¾ W., clears the reef off the East end of Pictou Island, at the distance of a long half mile; and also the Southern extremity of the Pictou Island Bank in 5¼ fathoms; therefore, if beating, tack in the board to the Northward, the instant the light begins to disappear behind Cole Point; and if running, keep the light just open to the Southward of Cole Point, bearing W.S.W., until you strike soundings in the low-water depth of 5 fathoms, on the edge of the bank off Logan Point; then follow the same depth about 1¼ mile to the S.W., taking care not to bring the light to bear to the Northward of West, and the vessel will be in safe anchorage in the road, where she may wait for daylight, or a pilot, according to circumstances. The branch pilots of Pictou are for the most part able and experienced men, and are always on the lookout for vessels. Although 19 feet at low water, in ordinary spring-tides, *can* be carried over the inner bar, yet the aid either of buoys, or of an able and experienced pilot, would be required to insure that depth; but 17 feet may be safely reckoned upon, if the following brief directions are strictly followed; and the greater depth will be carried in, if the endeavor to follow them exactly has been successful: Having a fair wind, and being further out than Mackenzie Shoal, the position of which has been pointed out, bring the light-house in one with Town Point at Pictou, bearing a degree or two to the Southward of West; or, which will be the same thing, with Smith Point, the extreme of the land on the same side beyond the town. Run with those marks on until Logan and Cole Points come in one, bearing N.E., when instantly sheer a little to the Northward, sufficiently to bring Town Point in one with the North extreme of the Sandy Spit. Keep the last-named marks exactly in one, until the Roaring Bull comes in one with Mackenzie Head, bearing S.E. by E. ½ E., when change the course smartly and run from those marks, keeping the Roaring Bull only just in sight, until the North extreme of Moodil Point (the first point on the South side within the light-house) opens out to the Northward of the

Outer Bar.

Inner Bar.

Pictou Road.

Pilots.

Inner Bar.

Sandy Spit; then haul to the Westward, at first towards the S.W. extreme of London Beach, and afterwards so as to pass midway between it and the Sandy Spit into the harbor.

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

Pictou Tides.

It is high-water at Pictou light-house, on the full and change days, at 10h.; and the rise is 6 feet in ordinary spring-tides, and 4 feet in neap-tides. With a good tide it is possible to carry 25 feet over the bar, and 23 feet may generally be reckoned upon; the harbor, therefore, is capable of admitting very large ships, but it must be remembered, that I always speak of the best of the two tides in the 24 hours for the diurnal inequality in the rise of the tides, which occurs more or less in all parts of the Strait, is very strongly marked in this harbor. I may add, that in the month of August, when our observations were made, the A. M. tides were always the highest, following the inferior transit of the moon with North declination in the first part of the lunation, and the superior transit with South declination in the latter part. The true or corrected establishment, as nearly as we could deduce it from the observations of one complete semi-lunation, was at 9h. 45m., mean time.

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

Water.

Sufficient water may be obtained here to supply the largest ships. The best watering-place is on the South shore of the harbor, three-quarters of a mile within its mouth, and there is another opposite the coal-loading place in the East River.

Pictou Town

THE TOWN OF PICTOU stands on the North shore of the harbor, 2 miles within the light-house.

Resuming our survey of the coast to the Eastward, the Roaring Bull, mentioned in the direction for Pictou, and distant 4 miles from the light-house, first claims our notice. It is the cliffy North point of a small peninsula, united to the main-land at its Western end by a sandy beach, and having at the other extremity the gully or entrance to Chance Harbor, dry, or nearly so at low-water. A reef of sandstone runs out to the N.E. from the Roaring Bull, 300 fathoms to the 3-fathoms line.

Chance Harbor.

Little Harbor.

In the shoal bay between Evans and Colquhoun Points, which are distant 5 and 6½ miles respectively from Pictou light-house, are two narrow, dangerous, and intricate channels, leading through shoals into Little Harbor. Of these channels the Eastern and best turns sharp in to the Eastward, within Roy Island, and close round the Sandy Spit at its S.W. extreme. The other is only a foot or two deep, and leads into the Western part of the harbor, which is several miles in extent, and broken into bays, coves, and picturesque points, but only fit for boats, being nearly all dry at low-water, excepting the intricate and narrow channels.

Roy Ledge.

Off the North shore of Roy Island, at the distance of 350 fathoms, and three-quarters of a mile N.W. ½ W. from Colquhoun Point, its East extreme, lies Roy Ledge, a small rocky shoal, with 9 feet least water. There is also a reef of sandstone in great part dry at low water, running out from Colquhoun Point half a mile to the Eastward; and as all these dangers have 5 fathoms close to them, vessels should be careful not to stand into less than 6 fathoms along this part of the coast. Roy Island, so called, is united at its East end to the main-land by a long and narrrow sand-bar, stretching to the S.E. across the East end of Little Harbor, to within three-quarters of a mile of King Head, which is the West point of entrance to Merigomish Harbor, and 8½ miles to the Eastward of Pictou light-house.

Merigomish Harbor.

MERIGOMISH HARBOR has 14 feet at low-water over its bar, and sufficient depth within for large ships; but it is so intricate and difficult of entrance that no directions would enable a stranger to take his ship in safely; and the Northerly winds send in so heavy a sea over the bar, that to get on shore going in would probably be attended with the loss of the vessel. The outer entrance of this harbor (three-quarters of a mile wide) is between King Head and Merigomish Point, the latter being the West extreme of Merigomish Island. The bar is formed by rocky shoals running out from these points of entrance, three-quarters of a mile to the Northward. The channel over the bar, and leading in from it between the shoals, is a long cable wide; but the shoals are so steep that the lead affords little guidance, and there are no leading-marks. The course running in is at first to the Southward, and then by a sharp turn to the Eastward close past Savage Point (the sandy spit at the S.W. extreme of Merigomish Island) into the harbor.

This inner entrance of the harbor, between Savage Point and the East end of Olding Island, is 240 fathoms wide; but the navigable breadth is reduced to 55 fathoms by the shoal off Olding Island, and the tides frequently run there at the rate of 5 miles an hour. Before the timber was exhausted, this harbor was frequented annually

by shipping, which usually laid moored close to the sandy S.E. point of Olding Island; but at present it is seldom visited by anything larger than a coasting-schooner. The pilots are therefore incompetent from want of practice, and the channel is no longer buoyed as it used to be formerly. The harbor is of great extent, running in 5 or 6 miles to the Eastward, within Merigomish Island, and the sand-bar which joins it to the main-land; and also 4 miles to the Westward, up a bay full of islands, coves, and precipitous headlands, which, together with well-cultivated fields, backed by mountains 800 or 900 feet high, form scenery of unusual beauty. Several small streams enter the harbor, of which French River, opposite the East end of Olding Island, is the principal. It is approached by a very narrow channel, through flats of mud and weeds, and can be ascended by boats to the bridge, about a mile within its entrance.

French River.

It is high-water at Betty Point, the S.E. extreme of Olding Island, on the full and change days, at 10h. 6m.; and the rise is from 5¼ to 3¼ feet, according as it may be spring or neap tides; but the diurnal inequality is strongly marked here, as well as at Pictou, causing a considerable difference in the times and the heights of the two tides on the same day.

Tides.

Merigomish Island. Coal.

MERIGOMISH ISLAND, 3¼ miles long by 1½ mile broad, is of clay and sandstone, belonging to the coal formation; rising to the estimated height of 150 feet above the sea. Thin seams of coal may be seen at Coal Point, where the cliffs, which form the Northern shore of the island, are 35 feet high. Its Southern shore, where there are increasing settlements, is broken into coves, cliffy islets, and peninsulated points, similarly to the Western part of the harbor. A sand-bar, 2½ miles long, unites the island to the main-land to the Eastward, excepting in unusually high tides, when the water washes over one part of it into the harbor.

From Merigomish Harbor to Cape George, a distance of 27 miles to E. by N., the coast is bold and free from danger. The land, rising from the sea to the summit of a ridge 2 or 3 miles in rear of and parallel to the coast line, is well settled, the cultivation extending occasionally to the summit of a ridge, which attains the extreme elevation of 1100 feet above the sea.

There is no harbor in this distance, the wooden pier at the village of Arisaig affording shelter only to boats and shallops in Easterly winds, but none in winds from between North and West.

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

Malignant Cove.

Malignant Cove, which has a small stream at its head, affording good landing for boats, is 3 miles further to the Eastward, and will be known by the Sugar-loaf Hill, a mile in rear of it, and 680 feet high above the sea at high-water.

NORTHUMBERLAND STRAIT.

Prince Edward Island.

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

West Coast of Prince Edward Island.

THE WEST COAST OF PRINCE EDWARD ISLAND, from the North to the West point, (a distance of 33 miles S.W. by W.,) is unbroken, and formed of red clay and sandstone cliffs, with intervening sandy beaches, affording landing for boats in fine weather. There are several ponds where boats can be secured, such as Nail and Black Ponds, and North and South Minimegash, but their outlets through sandy beaches, are all nearly dry at low-water, and of no use to vessels. The shallow water runs out to considerable distances off various parts of this coast; and as a general rule for large ships, it should not be approached nearer than the depth of 11 fathoms at night, or in thick weather.

North Point.

THE NORTH POINT, which is of low red cliffs, has a reef extending from it to the Northward and Eastward, 1¼ mile, to the depth of 3 fathoms, and nearly 2 miles to 5 fathoms; moreover, rocky and irregular soundings from 10 to 6 fathoms continue for several miles further out to the N.E., causing at times a dangerous breaking sea. Vessels should therefore always give this reef a wide berth in thick weather, or at night, and this, the soundings in the Admiralty chart will enable them to do; it is therefore only necessary to add, that it is most steep on the West side, where there are

10 fathoms at the distance of one-third of a mile. The inner part of the reef dries out half a mile from the point, affording shelter to fishing-schooners, which shift from side to side as the wind changes.

Off Nail Pond and Nail Head, 6 miles S.W. by W. from the North point, the shallow water extends 2 miles from the shore. *Nail Head.*

MINIMEGASH REEF is a ledge of rocks nearly dry at low-water, and nearly a mile in length parallel to the shore, from which its outer edge is distant half a mile. It lies directly off the sandy beach, and across the outlet of North Minimegash Pond, which is 15 miles from the North point. There are 2½ fathoms of water between the reef and the shore, and vessels have in one or two instances been moored there during the summer months to take in cargoes of lumber, but it is a very unsafe place. *Minimegash Reef.*

THE WEST REEF is a narrow and rocky ridge, 4 miles long North and South, and with very irregular soundings, from 2¾ to 5 fathoms. The least water, 16 feet, is near the middle of the reef, and there are 18 feet near its Southern extreme, which bears from the West point N.W. ½ W. 3½ miles, and is distant 2½ miles from the nearest part of the shore. Its Northern end is 3½ miles off shore at the highest part of the cliffs between Macwilliam Cove and Cape Wolfe. There are no leading-marks for this reef, and as there are 13 fathoms in one part close to its outer edge, it is very dangerous to ships rounding the West point, and can only be certainly avoided at night, or in thick weather, by following the edge of the bank of soundings off the main-land in 9 or 10 fathoms, which will lead past it at the distance of 3 miles to the Westward. There is a passage within the reef, between it and the West Spit, but it is narrow, with irregular soundings and strong tides, and should therefore never be attempted in a large vessel. The strength and direction of the tidal streams about this reef are very irregular, being influenced by winds, varying also with the time of tide, and probably with the age of the moon; as may be inferred from the peculiar tides at Richibucto and Shediac; and which also occur in Egmont Bay. In the deep-water channel passing close on the outside of the West Reef, the rate of the stream sometimes amounts to 2½ miles per hour, causing a heavy sea when running against the wind. The usual strength and direction is shown by the arrows on the chart. *West Reef.* *Tides.*

THE WEST SPIT of sand upon sandstone, covered in some parts with only a few feet of water, runs out from the West point 3 miles to the N.N.W., and then turns up N. by E. within the West reef, so that the latter overlaps it at the distance of half a mile. There is a "cul de sac" between the spit and the shore, open to the Northward, and in which there are from 6 to 4 fathoms of water. The only way to avoid getting into this opening, or within the West reef, when running down from the North-ward, is not to approach the island nearer than the low-water depth of 11 fathoms. *West Spit.*

THE WEST POINT consists of sand-hills 12 feet high. Excepting in the direction of the spit, the shallow water does not extend from it very far, and there is very good anchorage under it in winds from between North and East, and in 4 fathoms, fine sand bottom. *West Point.*

EGMONT BAY is 17 miles wide and 8 miles deep, the course across it from the West Point to Cape Egmont being S. by E. ¾ E. It affords excellent anchorage with off-shore winds, in from 4 to 7 fathoms, over sand and clay bottom; but vessels should not anchor in less than 5 fathoms anywhere, excepting on the N.W. side of the bay, because there is rocky ground, with only 3½ fathoms water off the river at its head, lying just within the 5-fathoms line, and at the distance of 3 miles from the shore, whilst along the Eastern shore, 5 fathoms would be too near the edge of the shoals. *Egmont Bay.*

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

PERCIVAL AND ENMORE RIVERS, at the head of the bay, are also only useful to boats and very small craft, having a depth of only from 4 to 7 feet at low-water, and being approached by exceedingly narrow and intricate channels, through flats of sand, clay, and oyster-beds, which are dry in part at low-water, and extend 1½ mile from the shore. The tides flow about 5 miles up these rivers, between low and marshy banks. The Eastern side of Egmont Bay should not be approached to a less depth than 5½ fathoms in a large vessel, for the shallow water off Rocky Point and the Bar of St. Jacques extends a mile from the shore. The church of St. Jacques is conspicuously situated 5 miles to the Northward of Cape Egmont, having the French or Acadian settlement along the ridge to the Northward of it, and the small river St. Jacques, with its saw-mills, half a mile from it in the opposite direction. Haldimand River, shallow and running in to the Southward about 2 miles, is about half-way between the church and Cape Egmont, and has sand-hills on its West or outer point of entrance. From those sand-hills a sand-bar, dry at low-water, extends 3 or 4 miles to the Northward, parallel to the shore, having very narrow channels through it, which are said to shift at times during heavy Westerly gales. At the time of our survey, the principal channel was pointed out by two small beacons on the shore, about a mile to the Southward of the *Percival and Enmore Rivers.*

church. The course in, with those beacons in one, was S.E. ¾ E., turning short to the Southward within the bar into a harbor for small schooners, 5 feet deep at low-water, and extending to the entrance of Haldimand River.

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

Egmont Bank. EGMONT BANK, of fine red sand, and with 4 fathoms least water, is very narrow, and 2½ miles long in a S.S.E. and N.N.W. direction. Its Northern end bears W.N.W. ¼ W., 5 miles from Cape Egmont; its Southern end W. ¾ S., 4 miles from the same headland, and there are as much as 8½ fathoms and a clear channel between it and the cape.

From Cape Egmont to Sea-cow Head, the course is S.E. ½ E., and distance 14¼ miles. A bank of comparatively shoal soundings commences at the former, and terminates at the latter headland; curving to the Southward, so as to extend to the distance of 3½ miles off shore; its Southern edge, in 5 fathoms, forms an excellent guide for vessels at all times; but very large ships should be careful of venturing within that depth, since there are only 3¼ fathoms, with rocky bottom, in one part, as will be presently mentioned.

Fifteen Point Church. FIFTEEN POINT CHURCH and village stand near the shore, 4¼ miles to the Eastward of Cape Egmont, and can be seen at great distances, either from the Eastward or Westward. At the extremity of the point, one mile to the Eastward of the church, there is a low rock above water, called the Little Dutchman, and shallow water to the distance of a long mile off shore; the depth then increases to near 4 fathoms for 2 miles further off, and then decreases again to 3¼ fathoms over sandstone bottom, not far from the edge of the bank, the church bearing from the shallow part nearly South, and being distant 3 miles.

Sandbury Cove. SANDBURY COVE, 9 miles to the Eastward of Cape Egmont, is an extensive place, but nearly dry at low-water, excepting a narrow channel through the flats, only fit for boats or very small craft. Miscouche Point is the Eastern point of this cove; and Miscouche church will be seen to the N.E. of it, at the distance of 2 or 3 miles inland.

Miscouche Shoal. MISCOUCHE SHOAL, off the point of the same name, dries out to the distance of 1¼ mile, and extends 2¾ miles to the Southward, to the depth of 3 fathoms, sheltering the roadstead in Bedeque Bay, outside Bedeque Harbor, from Westerly winds. The Northern extremes of Indian Head and Indian Island in one, bearing E. ½ N., clear the South point of the shoal in 14 feet water, but the lead will be a sufficient guide when a greater depth is required.

Bedeque Harbor. BEDEQUE HARBOR, situated in the bay to the Northward of Sea-cow Head, runs in to the Eastward between Indian Head and Phelan Point; the former, the South point of entrance, will be easily distinguished, being faced by sandstone cliffs 25 feet high, and rising to double that height a short distance back from the shore, whilst the other is comparatively low and wooded. The entrance between those points is 1¼ mile wide; but Indian Spit, which dries out half a mile from the head, and shallow water off the opposite shore, leave only a narrow channel into the harbor. Indian Island is a mile within the entrance, having no passage to the Southward of it, and the island shoal extending from it 400 fathoms in the opposite direction. The channel passes to the Northward of this shoal, and then turns to the Southward, within or to the Eastward of the island, where vessels may lie perfectly land-locked in 5 fathoms water. A depth of 20 feet at low-water, ordinary spring-tides, can be carried into the harbor, and, since the tides rise from 5 to 7 feet, there is water enough for the largest ships; but the channel is rendered so intricate by the Island shoal and Middle ground, which lies a little further out on the opposite side of the channel, that no directions would enable a stranger to enter this harbor without great risk of accident. The assistance of a pilot and of buoys becomes therefore indispensable; and it would be advisable to anchor in the bay or roadstead outside, until the former could be obtained. The anchorage in the roadstead is 22 feet at low-water, sand and clay bottom, and is quite safe during the summer months, although open to S.W. winds; the shallowness of the water, and the land at the distance of 4 or 5 leagues, preventing any very heavy sea from coming in. Should, however, any extraordinary circumstances render it expedient to attempt running into the harbor, the best mode of proceeding would be, to run along the South-eastern edge of the Miscouche Shoal, and then Eastward along the Northern side of the channel, by the lead, in the low-water depth of 18 feet, until Indian and Graham Heads come in one, bearing S.S.W. ¼ W., when the vessel should be immediately rounded to, with her head to the Southward, and anchored in about 4 fathoms, mud bottom: she will then be about 400

fathoms within Indian Spit, and in perfect safety. If the vessel be approaching from the Eastward with an Easterly wind, Sea-cow Head may be safely rounded at the distance of 2 or 3 cables, Graham Head may be passed at twice that distance, and then the edge of the shallow water off Salutation Cove may be safely followed by the lead, till we approach Indian Head, where the shoal becomes very steep, as is also Indian Spit, which however can frequently be seen, being dry at low-water. At a short distance within Indian Island, the harbor is divided into two arms, of which the Northern, Wilmot River, is only 2 or 3 feet deep, obstructed by oyster-beds, and crossed by a bridge 2 miles from the island. Vessels can ascend the Southern arm 1¼ mile beyond the island, the channel then becomes obstructed by oyster-beds, so as to leave only an intricate channel 4 feet deep at low-water; through which the new vessels built at Mr. Pope's building-yard, 1½ mile higher up on the South shore, are taken at high-water. Half a mile above Pope's Wharf, this arm, which is called Dunk River, divides into two narrow and shallow channels, crossed by bridges at the distance of a mile.

Bedeque tides.

It is high-water, on the full and change days, at Green's Wharf, on the North side of Bedeque Harbor, opposite Indian Island, at 10h., the rise being 7 feet in spring-tides, and 5 feet in neap-tides.

From Sea-cow Head to Carleton Head, S.S.E. ½ E., 6 miles, and from the latter to Cape Traverse, S.S.E. ¾ E., nearly 3 miles, the points are formed of red sandstone and clay cliffs, with coves between, affording shelter and landing for boats, and also anchorage for small craft, with the wind off the land, or in fine weather. The shallow-water does not extend beyond 300 fathoms off either of the three above-mamed headlands; but in the bays its 3-fathoms edge is sometimes twice that distance from the shore; and as the line of 5 fathoms is sometimes quite close to it, the general rule for vessels at night should be not to approach nearer than the depth of 7 fathoms. In the old charts a shoal with 3 fathoms water is shown off Carleton Head; but a diligent search has convinced us that it has no existence.

Provost and other Coves.

In the first 4 miles Eastward from Cape Traverse there are 3 coves, namely, Provost, Augustin, and Cumberland Coves, which are separated by points of cliff, and are dry at low-water.

Tryon River.

TRYON RIVER lies a mile further in the same direction, between Tryon Head and Birch Point, and is approached by a very narrow channel through the Western side of the Tryon Shoals. There is one foot of water over the bar of this channel at low-water in spring-tides; but the depth increases to 11 or 12 feet for a short distance within, and then the channel becomes still narrower, winding through flats of sand, mud, and weeds to the bridge, a distance of nearly 3 miles, following the channel. Small schooners enter Tryon with the assistance of the tide, which rises from 6 to 8 feet; and there are flourishing farms on each side of the river.

Tryon Shoals.

THE TRYON SHOALS, of sand upon sandstone, dry out 1½ mile off-shore, between Tryon and Brockelsby Rivers; and their S.W. extreme, in 3 fathoms, bears S. by W. ½ W., and is distant fully 2 miles from Tryon Head, the nearest part of the shore. At the distance of one-third of a mile N.E. from the S.W. point of the shoal, there are only 2 feet of water over rocky bottom, and at twice that distance the sands are dry at low-water. The S.W. point is steeper than any other part of these shoals, having 4½ fathoms close to it; but there is, nevertheless, sufficient warning by the lead, since the depth of 5 fathoms is nowhere less distant than half a mile from their ledge. There is, moreover, an excellent leading-mark, namely, Cape Traverse and Carleton Head in one, and bearing N.N.W. ¾ W., which clears the S.W. point of the shoals in 5 fathoms, and at the distance of a long half mile. Further Eastward, these shoals may be safely approached by the lead to any convenient depth, so that it will be perceived that they are by no means so dangerous as they have generally been considered: nevertheless, the lead should never be neglected when in their vicinity, for the tides round the island meet off them, causing variations in the strength and set of the streams, which it would require long-continued observations to understand or account for. The stream of ebb out of Bay Verte frequently sets over towards these shoals, so that a vessel standing along the land with a scant Southerly wind, will often find herself dropping to leeward towards them much faster than her usual amount of leeway would lead her to expect.

Crapaud Road.

CRAPAUD ROAD is a small but secure anchorage off the mouth of Brockelsby River, and between the Eastern part of the Tryon Shoals and the land. The space in which vessels may ride in from 12 to 15 feet at low-water, is about half a mile long by 2 cables wide; but the anchorage for small craft, in from 7 to 9 feet, is more extensive, continuing nearly a mile further to the Westward in a narrow channel or cove in the sands that dry at low-water. The entrance to this road, between the Eastern point of the Tryon Shoals and the shallow water off the shore to the Eastward, is only 90 fathoms wide, and 9 feet deep at low-water, spring tides.

To run for Crapaud Road, proceed as follows :—Bring the two white beacons that stand on either side of the entrance of Brockelsby River in one, bearing N. ¼ E., and run towards them until Wright's barn comes on with the Western side of Paul Bluff, bearing N.W. ⅝ N.; when change course towards the last-named objects, keeping them exactly in one; and when the vessel has run a cable's length, the marks for the steep Northern edge of the Tryon Shoals will come on, namely, Richard Point (the extreme to the Westward) in one with Birch Point, bearing N.W. by W. ½ W. Let the course towards Paul Bluff and Wright's barn be continued for the distance of two cables further; then change course towards Birch Point or W.N.W.; and when you have run a cable's length, let go the anchor, and the vessel will be in the best berth, and in from 13 to 15 feet water, over sand and mud bottom that holds well. No sea of consequence ever comes into this anchorage, the sands outside being covered only to the depth of a few feet at high-water, and the shallow water to the Eastward, off Inman Point and Brockelsby Head, overlapping the entrance.

Crapaud Tides. It is high-water on full and change days at 10h., and the rise is 8 feet in spring and 6 feet in neap tides; there is, therefore, a depth of from 15 to 17 feet at high-water in the entrance or on the bar of the roadstead. The tidal streams are weak and irregular; in general, their rates do not exceed half a knot at the anchorage, but they sometimes amount to 1½ knot for a short time along the edge of the shoals and in the entrance.

Brockelsby River. BROCKELSBY RIVER is all dry at low-water, excepting a very narrow winding channel through mud flats, by which boats can ascend to the bridge, 1¼ mile from the entrance. The land rises to the height of 250 feet from the Eastern bank of this river; and the neighboring country is pleasing and well settled.

Brockelsby Head. BROCKELSBY HEAD, 9 miles S.E. by E. from Cape Traverse, is the Eastern point of the bay in which the river and roadstead, last described, are situated. It has clay cliffs, 15 feet high, based upon sandstone, which run out a mile to the Southward, forming a dangerous reef, which must be carefully avoided by vessels approaching Crapaud from the Eastward.

Inman Rock. INMAN ROCK, with 4 feet least water, lies near the outer point of the reef just mentioned, two-thirds of a mile due South from Brockelsby Head, and with from 13 to 19 feet of water around it. Large vessels should not approach it nearer than the low-water depth of 4½ fathoms.

Marle Head. MARLE HEAD, 2½ miles S.E. from Brockelsby Head, has also a reef running out from it nearly a mile, and which should not be approached nearer than 5 fathoms.

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

From Marle Head to St. Peter's Island, a distance of 9 miles to the Eastward, the coast is strait and unbroken, and may be approached by the lead to 5 fathoms; bearing in mind that that depth is occasionally within 2 cables' length of shallow water, extending in some places three-quarters of a mile out from the shore.

Hillsborough Bay. HILLSBOROUGH BAY, having in it the principal harbor and capital town, and being the outlet of an extensive inland navigation, is the most important, as well as the largest, of any in the island.

St. Peter's Island. ST. PETER'S ISLAND will be recognized by its position; but I may add, that it is rather more than 3 miles in circumference, and of very moderate height, having cliffs of red clay and sandstone, 35 feet high, along its Eastern shore. There are several farms on either side; but the central parts of the island are thickly wooded. It is joined to Rice Point, the N.W. point of the bay, and from which it is distant 1¼ mile, by sands dry at low-water; boats, therefore, can only pass between it and the shore with the assistance of the tide.

Shallow water extends off the island 1¼ mile to the S.W. and S.; but the soundings, deepening out gradually, afford ample guidance in that part. Further Eastward the St. Peter's Shoals become much more extensive, stretching out 3¼ miles E. by N. from the N.E. point of the island. For the first 2 miles of that distance St. Peter's Spit of sand dries out, affording shelter to St. Peter's Road, fit only for small vessels, having only from 9 to 12 feet at low-water. Off the end of the spit lies the Spit Head, a rocky shoal, with 8 feet least water, which extends to within a quarter of a mile of the East extreme of the St. Peter's Shoals, where the Spit-head Buoy is moored in 5 fathoms, with the following bearings: viz., the West side of the Government House in Charlotte Town, in one with Battery Point, bearing N. ½ E.; the North side of St. Peter's Island W. ¾ S. and Gallows Point just open to the Northward of the dry spit of Governor's Island, S.E. ½ E.; but this dry spit can seldom be seen, and bearings alone to such distant objects are insufficient; therefore a beacon should be placed on the flat off the end of the dry spit, so as to form with Gallows Point a cross-mark, to insure the same position for the buoy every year. The 5-fathoms edge of the bank, forming the Western side of the channel, trends due North 2¼ miles from the Spit-head Buoy, to about a cable's length off Block-house Point, at the entrance of Char-

St. Peter's Shoals.
St. Peter's Spit.
Spit Head.

lotte Town Harbor. The edge of the St. Peter's Shoals may be safely followed by the lead in 5 fathoms as far in as the Spit-head Buoy; after which the bank becomes steep, and must be approached with caution in a large vessel.

THE TROUT ROCK, with 7 feet least water, lies 2 cables within the edge of the bank, and a long half mile out from Block-house Point, which, kept in one with Government House, bearing N. by E. ¼ E., will just clear the rock to the Eastward in about 14 feet water. *Trout Rock*

On the opposite or Eastern side of the channel the shallow water is continuous, from Sea-trout Point, at the entrance of the harbor, to Governor Island, there being only a passage for boats or small craft between that island and the land to the N.E. of it. The edge of the bank, in 5 fathoms, runs to the South from Sea-trout Point to opposite the Spit-head Buoy; consequently parallel, in this part, to the bank on the opposite side, leaving a channel from 7 to 12 fathoms deep, and either one-third of a mile or half a mile wide, according as we conceive it to be bounded by the 5-fathoms or 3-fathoms line. The bank is most steep opposite the Spit-head Buoy, where the rocky Squa Shoal, with 10 feet least water, approaches close to its edge. *Squa Shoal.* Battery and Sea-trout Points in one, bearing North, form an excellent mark for this side of the channel, leading along the edge of the bank, in 4½ fathoms least water, from near Sea-trout Point to a quarter of a mile beyond the Spit-head Buoy on the opposite side; but it had better not be followed further to the Southward in a large ship, although smaller vessels may do so, until Governor Island and Gallows Point are touching; bearing in mind, that it finally leads over the reef off the West end of the island.

GOVERNOR ISLAND lies 4½ miles, E. by N., from St. Peter's Island; and 4 miles, S. by E. ½ E. from Block-house Point. It is low, in great part wooded, based upon sandstone, and has dangerous shoals round it on all sides; but Governor Shoals, extending from it to the S.W., and adding greatly to the dangers of the navigation, more especially claim our attention. Stretching out from the West end of the island, the sandstone reef is dry at low-water for the first half mile, and has less than 3 fathoms for an equal distance further; after which, rocky and irregular soundings continue to the West extreme of the shoals, in 5 fathoms, distant 2 miles from the island. Fitzroy Buoy is moored in 4 fathoms, a cable's length within the West extreme of the shoals; with the square tower of the Presbyterian church at Charlotte Town and Battery Point in one, bearing N. by E., ¼ E.; and the N.W. extreme of Governor Island and Pownell Point touching, and bearing E. by N. *Governor Island.* *Governor Shoals.*

FITZROY ROCK, with 20 feet least water, lies about a cable's length to the Eastward of the buoy, and was considered the principal danger off the island, until our survey led to the discovery of the much more dangerous rocky patches which are scattered over these shoals further to the Southward. *Fitzroy Rock.*

Of these patches, Huntley Rock, bearing S. by W. ½ W., 1¾ mile from the W. end of the island, has the least water, namely, 12 feet at low-water; but there are others, with from 17 to 22 feet of water, as far out as 2½ miles, and the S.W. extreme of the shoals in 5 fathoms is distant 3½ miles from the island. The mark for Fitzroy Buoy, namely, the Presbyterian Church and Battery Point, bearing N. by E. ¼ E., clears the West side of Governor Shoals in 5 fathoms, excepting the small portion of the West extreme to the Westward of the buoy. *Huntley Rock.*

Prim Point, the S.E. point of Hillsborough Bay, is low, with cliffs of sandstone 10 to 15 feet high.

THE LIGHT-HOUSE, of brick, and of the usual conical form, shows a fixed light, 65 feet above the sea at high-water, and which can be plainly seen from the deck of a vessel at the distance of 4 or 5 leagues. It is of the greatest use to vessels, especially when approaching from the Eastward, guiding them, by its bearing, clear of the Rifleman and Pinette Shoals, and enabling them to enter the bay in the darkest night. It stands 50 fathoms within the S.W. extremity of the point, the West extreme of St. Peter's Island bearing from it N.W. ½ W., 7¾ miles; the W. end of Governor Island N. ¾ E., 5 miles; and Bell Point (the extreme to the Eastward) S.E. ½ S., 10 miles. *Light-house.*

PRIM ISLAND, which has also low cliffs, is distant 1¼ mile E.N.E. from the extremity of the point, and is united to its North side by sand-beaches, inclosing marshy ponds. *Prim Island.*

THE PRIM REEF, of sandstone, runs out to the Westward, both from the island and the point, so as to form a forked reef, with very uneven soundings; its Northern point, in 3 fathoms, bears N.W. by W. ½ W., 2 miles from the light-house, and the other point, W. by S. 1¼ mile; but if we consider the reef as bounded by the depth of 5 fathoms (which we must do for a large ship), it is much more extensive, reaching out to the distance of 3 miles. *Prim Reef.*

The Square Tower of the Presbyterian Church at Charlotte Town, in one with Battery Point, bearing N. 13° E., will clear the 3-fathoms extreme of Prim Reef; and the same church tower, in one with Block-house Point, bearing N. by E. ½ E. will clear the

whole of the reef; but it is only in very favorable weather that such distant objects can be seen, and, therefore, the lead must be the main dependence; the soundings, combined with the bearing of the light, being amply sufficient for rounding the reef, as will be seen in the chart. Having thus described the dangers of the approach through Hillsborough Bay, I must add a brief description of the harbor, and then give the requisite directions.

Charlotte Town Harbor. CHARLOTTE TOWN HARBOR is 428 fathoms wide at entrance, between the cliffs of Block-house and Sea-trout Points; but shallow water, extending from both shores, reduces the navigable width of the channel ,reckoning from 3 fathoms, to 230 fathoms; and as the shoals are very steep, it would require to be well buoyed before a large ship could beat in or out with safety. Cliffs of red sandstone, from 10 to 30 feet high, form the shores on either side, the land rising gradually from them in undulations, and being partly cultivated and partly wooded. An old block-house and signal-post stand on Block-house Point, the West point of entrance. The next point of cliff on that side as we proceed in is Alchorn Point, and at the distance of half a mile from the Block-house, the remains of Fort Amherst may yet be seen on the hill, 93 feet above high-water. We have next Warren Cove and Farm, with Ringwood, the place of Captain Cumberland, and lastly, Canseau Point, with its white beacon, 1¼ mile from the block-house.

Canseau Shoal. CANSEAU SHOAL extends off Canseau Point to the distance of 350 fathoms, and will be cleared by keeping the Block-house just open, clear of Alchorn Point; observing that the extremes of the cliffs of Block-house and Alchorn Point in one, lead over the point of the shoal in 16 feet at low-water. On the opposite or Eastern side of the entrance, and less than a mile within Sea-trout Point, we have Battery Point, with its shoal; the latter running out 200 fathoms, and having on its extreme point a buoy moored in 3 fathoms at low-water. Outside that depth, on either side. the water deepens abruptly, and there are 13 fathoms in the middle of the channel. The Red Beacon and Presbyterian church tower at Charlotte Town, clear the shoal off Battery Point in 10 fathoms and at the distance of 60 fathoms. Within the harbor, in addition to the flats of mud and weeds extending off shore, there is the MIDDLE GROUND, with 17 feet least water, and for the situation of which I must refer to the plan of the harbor, remarking here, that the White Beacon on Canseau Point and McKinnon's log-house in one, lead through midway between it and the flat off the Southern shore.

Middle Ground. White Beacon.

Immediately within Canseau and Battery Points, which are the inner points of entrance, the channel expands into one of the finest harbors in the world, having depth and space sufficient for any number and description of vessels. In sailing in, we see before us York River, running in to the Northward; on our right the Hillsborough, stretching away to the E.N.E. as far as the eye can reach; and on our left Elliot River, running in to the Westward. The confluence of the streams of these three rivers, between Canseau Shoal and the mouth of York River, form THE THREE TIDES, where there is excellent anchorage, used occasionally by laden vessels preparing for sea, the usual anchorage being off the wharves of the town, where the channel is 280 fathoms wide, and nearly 10 fathoms deep.

The Three Tides.

Charlotte Town. CHARLOTTE TOWN is advantageously situated on the Northern bank of the Hillsborough, a short distance within its entrance and at the point where the deep water approaches nearest to the shore; its wharves, however, still requiring to be 120 fathoms long to reach the edge of the channel.

Charlotte Town Tides. It is high-water, on the full and change days, at 10h. 45m., and the rise in ordinary spring-tides is 9½ feet, and in neap-tides 7 feet. Their rise is considerably influenced by the winds, so that we have seen spring-tides during N.E. gales rise 11 feet, and neaps during S.W. gales only 6 feet; but these were extraordinary cases. The duration of the two tides is nearly equal, and their streams continue about a quarter of an hour after high and low water by the shore; running usually at the rate of 1¾ knots off the town, and 2½ knots in the entrance of the harbor.*

Hillsborough River. Of the three rivers that unite in the harbor, the HILLSBOROUGH is the largest, being navigable for the largest ships to the distance of 7 or 8 miles, and for small vessels 14 miles above Charlotte Town; where there is a bridge 2 miles from the head of the river. There is a portage of less than a mile across, from the Hillsborough, near its head, to Savage Harbor, on the North coast of the island.

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

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

YORK RIVER, the smallest of the three, is crossed by Poplar Island bridge, 2¾ miles from its mouth. Elliot River may be ascended 4 or 5 miles by large ships, and 9 or 10 miles by small craft and boats. The shores of all three rivers are settled, and the country generally fertile. *York River.* *Elliot River.*

POWNELL BAY is shallow and open to the Westerly winds; it affords shelter to small craft and boats near its head, which dries extensively at low-water. *Pownell Bay.*

GALLOWS POINT, separating Pownell and Orwell Bays, has a long reef of sandstone, and extensive shoals off it, on which are scattered rocks covered with only a few feet of water. These shoals extend in the direction of Governor Island, to the distance of 2 miles, and also a long mile, towards Point Prim. There is, moreover, a detached shoal, with 13 feet least water, bearing W. ½ N., 2 miles from Gallows Point. *Gallows Point.*

ORWELL BAY, leading to Orwell, Vernon, and Seal Rivers, is 2 miles wide at its entrance, between Gallows and Buchanan Points; the latter on the Southern shore being 5 miles within or to the Eastward of Prim Point. *Orwell Bay.*

PINETTE HARBOR, 4 miles Eastward from Prim Point, has only 2 feet at low-water over its rocky and exceedingly dangerous bar. The bar is nearly a mile out from the entrance, and the PINETTE SHOALS reach to double that distance; their outer point, in 3 fathoms, extending several cables' length beyond the line joining Prim Point, and the extreme to the South-eastward, and bearing from Pinette Point W.S.W., 2 miles. There are only 9 feet of water just within this point, and only 3 feet at no great distance, the bottom being rock. These shoals are therefore very dangerous, and should not be approached nearer than the low-water depth of 6 fathoms. It is high-water, on the full and change days, at Pinette, at 10h., and the rise is 8 feet in spring and 5 in neap-tides. *Pinette Harbor.* *Pinette Shoals.* *Tides.*

FLAT RIVER, which is only fit for boats, is 3 miles to the S.E. from Pinette. Shallow water extends off Macdougal Point, its Eastern point of entrance, to the distance of a mile. *Flat River.*

THE RIFLEMAN REEF, of sandstone, stretches out to the distance of 2 miles from Stewart Point, which bears from Prim Point S.E. ½ S., 9 miles. On the extreme outer point of this reef, in 3 fathoms, Prim light bears N.N.W. ½ W., 8 miles, Macdougal Point N.N.E., and Stewart Point E. ¼ S., 2 miles. Just within this point there are 8 feet of water, and half-way between that and the shore only 5 feet, while between those and other shallow patches there are 12 feet at low-water. The very irregular soundings off this reef, and the deep water close to it, (16 fathoms within less than half a mile,) while there is a much less depth further out, render it one of the greatest dangers in the strait. The bearing of the light on Point Prim will greatly assist vessels in avoiding it: but at all times, either by night or by day, and especially in thick weather, it should be approached with care. There are no leading-marks for its West extreme, which has 7 fathoms close to; but the soundings give better warning there than further to the Southward. The wooded point, within and opposite the Wood Islands, in one with Black Point, the extreme to the Eastward, bearing E.S.E., just clear the Southern side of the reef; but the safest plan, when approaching it from the Southward, will be to tack, as soon as the extreme of the land to the Eastward appears within the Wood Islands, bearing E.S.E. ¾ E., when the vessel will be 1¼ mile from the reef. *Rifleman Reef.*

When standing towards the reef at night, take care that Prim light is not brought to bear to the Westward of N.N.W. If the light is not seen, a close attention to the soundings can alone insure safety. Observe, in standing across the strait from the Southward towards the reef that, after having upwards of 20 fathoms towards the Southern shore, the soundings will decrease to between 11 and 9 fathoms for several miles, and then suddenly increase again to from 14 to 16 fathoms. When the vessel arrives at this deep water she will be less than a mile from the reef, and if she ventures across it to 10 fathoms, she will be distant only 300 fathoms from its edge.

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

THE INDIAN ROCKS, considering them to be bounded by the depth of 3 fathoms, occupy a space of 1½ mile in length, parallel to the shore between Bell Point and the Wood Islands, and half a mile in breadth. They are of sandstone, dry to a considerable extent at low-water, and their Southern edge is 1½ mile off shore. The S.E. extreme of these rocks bears S.W. by W., nearly a mile from the West end of the Wood Islands, and will be cleared to the Southward if the S.E. point of those islands be not brought to bear to the Eastward of E.N.E. The Western extreme of the rocks bears from Bell Point S. by E. 1¾ mile, and Macdougal and Pinette Points in one, bearing N. by W. ½ W., will clear it to the Westward, at the distance of three-quarters of a mile; but Pinette Point cannot always be distinguished. The want of *Indian Rocks.*

sufficient leading-marks, and the deep-water so close to the Southward, would render these rocks exceedingly dangerous by day, as well as by night, if there were not almost always breakers or a rippling to be seen on the part that dries. In standing towards them at night, observe that there are 10 fathoms within a quarter of a mile of their Southern edge; and that 13 fathoms is near enough to their S.E. extreme, and 10 fathoms to their S.W. point, taking care not to get between the latter and the Bell Point Reef, where there are also 10 fathoms. There is a channel between the Indian Rocks and the shore more than half a mile wide, and from 4 to 16 fathoms deep; but it is of no use to shipping, the soundings being irregular, with rocky or gravelly bottom and strong tides. It may as well be added, that the extreme of the land to the Eastward and the inner side of the Wood Islands in one will lead in between the Bell Point Reefs and the rocks, and clear their Northern edge in 5 fathoms; and that the line of Stewart and Bell Points in one, bearing N.W. ½ N., passes along their N.E. side in 3 fathoms; the former of those points must therefore be shut in behind the latter to pass between the rocks and the Wood Islands.

Tides. The tidal-streams are strong in the deep-water just outside these rocks, frequently running at the rate of 3 miles per hour. It is high-water on the full and change days at 9¾ hours nearly, the rise being 6 feet in spring and 4 feet in neap-tides.

Wood Islands. THE WOOD ISLANDS are now only in part covered with timber, there being at present two families residing on them, who have cleared the greater part of their surface.

They are two small islets, and, with their connecting sand-bar, are 700 fathoms in length, parallel to the shore, from which they are distant about half a mile. The Eastern or larger islet is 350 fathoms long and about 50 feet high. They both present cliffs of sandstone to seaward, and are united to the shore by a long sand-bar at their Western extremity. The space between the islets and the shore forms a secure boat-harbor, having an entrance from the Eastward; but it is all nearly dry at low-water. The shallow water does not extend off these islands to the Southward beyond two cables; but continues from them across the bay to the Eastward as far as Little Sands, a distance of 3 miles. The anchorage to the Eastward of the islands, within the distance of a mile, and at any depth from 3 to 9 fathoms, is good in N.W. winds, the Indian Rocks breaking the sea.

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

White Sands WHITE SANDS is a settlement, receiving its name from the sandy beach of a small bay, 9 miles Eastward from the Wood Islands. There is a sand-spit there, just covered at low-water, which affords some shelter to boats, and a sandy shoal extending to the distance of half a mile off-shore. The edge of this shoal is so steep, and the water near it so deep, that the lead gives no warning; but if Blackrock Point (the extreme to the Eastward) be kept open to the Southward of Guernsey Point (the West side of Guernsey Cove), the shoal will be cleared; for those points in one, bearing E. by N. ½ N., lead along its Southern edge. Guernsey and Blackrock Points, distant 1½ and 3 miles respectively to the Eastward of White Sands, have each large rocks above water close off their cliffs; and so also has Cape Bear, which is 600 fathoms further to the Eastward; but the rock off the cape is much higher than the others, its summit being about 12 feet above the sea at high-water, whilst Blackrock is only 7 feet, and the other still lower.

Blackrock Point.

The shore to the Eastward of White Sands is formed of sandstone cliffs, which are in some places 40 feet high, without beach or landing, except at Guernsey Cove, and from which the shallow water does not extend beyond 350 fathoms until we arrive near Cape Bear.

NORTHUMBERLAND STRAIT—THE EAST COAST OF PRINCE EDWARD ISLAND FROM CAPE BEAR TO THE EAST POINT—THE NORTH COAST OF PRINCE EDWARD ISLAND.

Cape Bear. Murray Head. CAPE BEAR will be known by the large rock, 12 feet high, which lies close under its cliffs of red sandstone; and MURRAY HEAD, a mile further to the Northward, by its forming the extreme North-eastern point of the cliffs, where they turn abruptly to the Westward towards Murray Harbor. At the distance of 350 fathoms to the Southward of Murray Head, there is a fine little stream of fresh water, worthy of notice, because there are so few places on the island where a large ship can readily water. Boats can land there in Westerly winds, when vessels will find good anchorage under the Head.

Fresh Water.

Bear Reef. BEAR REEF runs out to the Eastward, from between Cape Bear and Murray Head, three-quarters of a mile, to the depth of 3 fathoms, and one mile to 5 fathoms; and is composed of sandstone and large stones. There is very little water over the greater

part of this extensive and irregularly shaped reef, which has 7 or 8 fathoms close to its edge, and is therefore very dangerous to vessels rounding the Cape at night or in foggy weather, when they should not approach nearer than 10 fathoms, either to the Eastward or Southward of the reef.

There are no close leading-marks for passing to the Eastward of this reef; but Panmure Head and Terras Point in one, and bearing N. ½ E., clear it the distance of one mile in that direction.

To clear its Southern side Guernsey Point must be kept well open to the Southward of Blackrock Point.

Fisherman's Bank.

FISHERMAN'S BANK, which was first examined and laid down by us in 1844, is of sandstone, thinly covered with stones, gravel, and broken shells. Within the depth of 10 fathoms, it is 3 miles long East and West, by 1½ mile broad; but the shallow central part, with from 4 to 5 fathoms at low-water, covers scarcely half that space. The least water, 4 fathoms, bears from Murray Head, the nearest land, E.S.E., 7½ miles; and there is another patch with 5 fathoms three-quarters of a mile further East. There are irregular soundings, from 10 to 20 fathoms, between this bank and Bear Reef, and in every other direction around it from 15 to 20 fathoms. It is very dangerous to large ships when there is a heavy sea running, and should not then be approached nearer than 13 fathoms, which, in most parts, is close to its 10-fathoms edge, and little more than half a mile from the shallow water. The steeple of the English church at George Town in one with Panmure Head, bearing N.N.W. ½ W., leads over the bank in 5 fathoms; but the church can seldom, if ever, be seen from the bank, being distant from it 15 miles.

Murray Harbor.

MURRAY HARBOR has an exceedingly dangerous bar of sand, over which 10 feet can be carried at low-water in ordinary spring-tides; but strong Easterly winds send in so heavy a sea as to render it at times impassable, a line of breakers extending then completely across the bay from Murray Head Northward to Cody Point, a distance of nearly 2¼ miles.

On the outer edge of the bar a Buoy is moored in 3 fathoms, with the White Beacon on Oldstore Point (the sandy South point of entrance) in one with the black ball on the white gable of the Transit Barn, bearing W.S.W. ¾ W. The barn stands on the Southern shore of the harbor three-quarters of a mile within the entrance, and when in one with the beacon leads in through the deepest water. There is, moreover, an inner buoy in the fairway, half a mile within the outer one, which is intended to enable vessels to run in when hazy weather prevents the leading-mark from being seen.

Proceeding in from the bar, the channel, between sandy shoals extending from the shore on either side, contracts gradually in breadth to 60 fathoms, and expands again to 200 fathoms within the entrance. The depth also gradually increases, after crossing the bar, to 6 fathoms, as we pass close to the steep sandy beach of Oldstore Point, on which the beacon stands. To run in proceed as follows:—Look out for the outer buoy, or, being in not less than 5 fathoms, bring the White Beacon and the black ball on the white gable of the Transit Barn in one, bearing W.S.W. ¾ W., and keep them so exactly until the vessel arrives within 200 or 150 fathoms of the beacon, when haul a little to the Northward, so as to pass Oldstore Point at the distance of 20 or 30 fathoms, and anchor within, or to the West of it, at any distance not exceeding a quarter of a mile; because, further in, the channel which passes to the Southward of all the islands becomes very intricate, and would be difficult to follow without a pilot. The depth, in the anchorage recommended, is from 3 to 5 fathoms, with sand and clay bottom, and a tide of 2 knots. It is high-water, on the full and change days, at $9\frac{1}{10}$ hours after the moon's transit, and the rise is 6¼ feet in spring tides, and 3¼ feet in neap tides. The entrance of Murray Harbor, between Oldstore Point and the long sandy spit that runs out to the S.W. from Cody Point, is more than half a mile wide, but it is all nearly dry at low-water, excepting the channel already described. Within this entrance the harbor is of great extent, containing five wooded islands, and several rivers or sea-creeks on either side, besides the main inlet, Murray River, which is much larger than the rest, and navigable to the distance of 6 miles from the entrance, or nearly to the dam which has been constructed across it near its head. There are flourishing settlements all around, the principal one being at South River, where the English Episcopal church, distinguished by its steeple, will be seen on the Southern shore, 2 miles within the entrance of the harbor.

Tides.

Murray River.

Graham Point and Ledge

Proceeding with our survey of the coast from Murray Head, a distance of 4½ miles, N.N.E. ¼ E., brings us to Graham Point, from which Graham Ledge runs out one mile to 5 fathoms, and three-quarters of a mile to 3 fathoms. The shallowest part of this ledge, with 6 feet least water, bears E.N.E., 400 fathoms from the extremity of the point. There is also a rocky shoal one mile further to the Northward, which runs out two-thirds of a mile from between Terras and Smith Points, and foul ground with from 4 to 5 fathoms at low-water extends off the latter to the distance of 1½ mile. The soundings are very irregular off this part of the coast, between Graham Point

and Panmure Head, varying from 13 fathoms, mud, to 5½ fathoms, rock, until we get beyond 3 miles out from the shore.

George Town Harbor. GEORGE TOWN HARBOR, sometimes called Three Rivers, is situated on the S.W. side of Cardigan Bay, 3 miles within or to N.W. by N. from Panmure Head, which is distant 9 miles to the Northward from Cape Bear. It is the finest harbor in the Southern part of the gulf, excepting Charlotte Town, having depth of water and space sufficient for the largest ships. The rise of ordinary spring-tides being only 5 feet, is a great advantage as compared with with Charlotte Town Harbor, but, on the other hand, the ice does not, in general, form in it so soon in the fall by several weeks, and also breaks up earlier in the spring, so that vessels can enter it later and leave it earlier, which is an important advantage in a climate where the navigation is closed by ice for so long a portion of each year. The channel leading to the entrance of the harbor passes between the shoals off Panmure Island and Cardigan Point. A brief description of these shoals, and the objects for avoiding them, will be useful in illustration of the chart, and to render the directions intelligible.

Panmure Ledge. PANMURE LEDGE, of sandstone, covered by only a few feet of water, runs out 600 fathoms from Panmure Head, the East extreme of Panmure Island, to the depth of 3 fathoms; and its outer extreme, in 5 fathoms, and 900 fathoms off shore, will be just cleared by keeping Graham Point and Murray Head in one, bearing S.S.E. W. ¼ W.

Panmure Island. PANMURE ISLAND is about 2 miles long by one mile broad, in great part wooded, and has cliffs of red sandstone 40 feet high along its North-eastern shore. It is joined to the land to the Southward by a narrow sand-bar always above water, and more than a mile in length. Within this bar is St. Mary Bay, and further Westward Sturgeon and Livingstone Bays; all three having a common entrance to the North-west of the island, between Panmure Spit and the shoal off Grave Point, and which, although very narrow, has depth of water sufficient for the largest ships.

Panmure Shoal and Spit. PANMURE SHOAL extends to the distance of two-thirds of a mile off the Northern shore of the island; and PANMURE SPIT, which forms the Western side of the shoal, and is of sand, dry at low-water, equally as far to N.N.W. from Billhook Point, the N.W. extreme.

The Panmure Buoy (white) is moored close to the steep edge of the shoal, in 5½ fathoms, with M'Donald's house and store, on the West side of the island, just open to the Westward of Billhook point, bearing S. by W. ½ W., two-thirds of a mile; and the English Episcopal steeple at George Town on with the East side of the Thrumcap, bearing N. by W. ½ W. The Panmure Shoal and Spit, and further in the equally steep shoals off Grave and St. Andrew's Points, form the dangers on the South side of the entrance channel to George Town Harbor.

Cardigan Shoal. On the opposite side we have the CARDIGAN SHOAL, extending to the South and East from Cardigan Point, which separates Cardigan River from the harbor. This extensive shoal is of sandstone, and has only one fathom at low-water, three-quarters of a mile out from the shore. At the distance of one cable further out there are 3 fathoms, and the Red Buoy, moored on its S.E. extreme in 5 fathoms, is distant 1⅛ mile from the low cliffs at the extremity of the point. At this buoy Panmure Head (distant 1½ mile) should be in one with Terras Point, bearing S. ¼ W.; and French Point should be seen over the sandy spit of Aitkin's Point, and in one with its wooded extreme, bearing N.W. by W. ½ W. At the distance of one mile W. by N. from the Red Buoy, and on the S.W. extreme of Cardigan Shoal, a Black Buoy is moored in 4 fathoms, with Cardigan Point bearing N.N.E. ¾ E.; Brudenell Islet and Guadin Point touching and bearing N.W. ¾ N.; and the White Buoy on Panmure Shoal S.W. ¼ W., distant one quarter of a mile. In a direct line from the red to the black buoy of the Cardigan Shoal, there is not less than 3½ fathoms, and the Southern edge of the shoal in 5 fathoms, may be followed by the lead from the one to the other. From the black buoy the Western edge of the shoal trends Northward to within one cable of the shore, sheltering the outer anchorage (in 5 fathoms, mud bottom) between it and the knoll.

The Knoll. THE KNOLL, a small sandy shoal, probably based upon sandstone, and with 9 feet least water, lies just outside the entrance of the harbor, and directly in the way of vessels. To enable vessels to beat in and out with safety, a buoy should be placed on its S.W. extreme, with the following marks and bearings; namely, Boughton Island and Cardigan Point touching, and bearing E. ½ N.; Grave and Thornton Points in one, S.W. ½ W.; the West side of the Thrumcap N.N.E., 425 fathoms; Cardigan Black Buoy S.E. ½ E. nearly one mile; and lastly, the Thrumcap Black buoy, (if properly placed), N.N.W., 370 fathoms, and in one with Guadin Point.

Thrumcap Shoal. THE THRUMCAP SHOAL runs out from the Thrumcap (which is a small wooded and cliffy islet joined to the Eastern point of entrance of the harbor by a sand-bar) 305 fathoms, in a W. by S. direction. On its S.W. extreme, in 3 fathoms, a Black Buoy is moored with the cupola of the Roman Catholic church and the steeple of the Eng-

lish Episcopal church in one, bearing N. ¾ E.; the N.W. side of the Thrumcap E. by N., and the beacon at Whiteman's Wharf S.W. ¾ S. This shoal, which is of sand, and dry at low-water nearly all the way out to the buoy, completes the shelter of the harbor, preventing any sea of consequence from rolling in. The entrance, between the Thrumcap and St. Andrew's Point on the South-western shore, is two-thirds of a mile wide, but the shoals diminish the breadth of the channel to 230 fathoms, and it is still narrower at the Knoll, where it is scarcely 200 fathoms; whilst further out still, between Cardigan nnd Panmure Shoals, it is no more than 250 fathoms; considering it to be bounded by the depth of 3 fathoms on each side. Within the Thrumcap the Northern shore of the harbor forms a bay three-quarters of a mile wide, the N.W. point of which is Guadin Point. having a sandy spit running out from it one-quarter of a mile to S.W. The usual and best anchorage for large vessels is between this spit and the Thrumcap Shoal, in 5 fathoms, mud: but smaller vessels may anchor further within the bay, and will find 2¾ fathoms within the distance of one cable from the wharf at the town.

GEORGE TOWN, the capital of King's county, is well situated on the Northern shore of the harbor, just to the Eastward of Guadin Point. *George Town.*

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

Observe that, in addition to the aid afforded by the buoys, there is a beacon at the inner end of Whiteman's Wharf on St. Andrew's Point, which. kept in one with the centre of his house, bearing N.W. by W. ½ W., leads in between Panmure and Cardigan Shoals nearly in mid-channel, until Brudenell Islet and Doctor's Point come in one, bearing N.N.W. ¾ W.; when the last-named objects kept touching lead into the harbor.

Having, therefore, a fair wind, that is, any wind from S.W. round by South and East to N.E., proceed as follows:

Approaching from the Eastward, pass Boughton Point, the S.E. extreme of Boughton Island, at the distance of one mile; steering W.N.W. ½ W., and looking out for the beacon and Whiteman's house, which will be a little on the starboard bow. As soon as the vessel arrives within one mile of Panmure Island, bring the beacon and house in one, and steer for them N.W. by W. ½ W., or as may be necessary to keep them so. When Panmure Head and Terras Point come in one, the red buoy on the Cardigan Shoal should be seen bearing N. ¼ E., and distant half a mile, and the vessel should be in 7 or 8 fathoms water. At the same time, the black buoy of the Cardigan and the white buoy of the Panmure Shoal should be seen on her starboard and port bows respectively, and at the distance of one mile. Continue to run towards the beacon and house exactly in one (passing between the last-named buoys,) until you have approached within half a mile of the beacon, when Brudenell Islet and Doctor's Point will be seen (up Brudenell River to the N.W. of the town) touching and bearing N.N.W. ¾ W. If you can now see the Thrumcap Buoy, which should bear N. by W. ½ W. two-thirds of a mile, you will have only to steer so as to give it a berth of one cable as you pass to the S.W. of it into the harbor. But if the buoy be not seen, run towards Brudenell Islet and Doctor's Point touching, until the Roman Catholic church cupola is seen well to the N.W. of the English Episcopal church steeple, or until the latter bears not less to the Eastward than N. by E. ½ E., where you may haul towards it, and choose your berth in from 6 to 3 fathoms, over mud bottom. *Directions*

Approaching from the Southward, round Panmure Ledge by the lead in 7 fathoms, or by keeping Murray Head open to the Eastward of Graham Point till the North side of Panmure Island bears as far to the Westward as N.W. by W. ½ W., when the vessel may haul in to the North-westward, following the Northern edge of the Panmure Shoal until the Beacon and House can be made out, and brought in one, as before directed. If it should so happen that, from thick weather, or other cause, the Beacon and House cannot be seen, the Northern edge of Panmure Shoal may safely be followed by the lead, in 6 fathoms, to within half a mile of the White Buoy, when the shoal becomes too steep to be safely followed further. In like manner the Southern edge of Cardigan Shoal may be followed, from the Red Buoy to the Black Buoy on its S.W. extreme, as I have already remarked; and the vessel may either bring up, in the outer anchorage, half a mile within the latter in a line towards the Thrumcap, or proceed into the harbor, as may be expedient. Between Gaudin Spit and Aitkin's Point the channel of the harbor is only 175 fathoms wide, from 3 fathoms to 3 fathoms, and 6½ fathoms deep; but it expands again immediately, affording excellent anchorage all the way to Brudenell Point, one mile above the town.

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

Tides. It is high-water on the full and change days at 8h. 40m. after the moon's transit, by the mean of the morning and evening tides; the latter being generally the latest by about an hour in the summer months. The rise is 5 feet in spring, and 3½ feet in neap tides.

The rate of the tidal streams does not exceed ¾ of a knot.

Boughton Island. BOUGHTON ISLAND, not quite so large as Panmure Island, is united on the North-east side to Bruce Point by a dry sand-bar one mile in length, and is divided into two parts, of which the Southern, one-third of a mile long, is joined to the remainder by a double bar of sand and shingle inclosing a large pond.

Boughton Ledge. BOUGHTON LEDGE runs out at this bar to the distance of 600 fathoms to the Eastward, and has rocks near its outer extreme which always show. Boughton Point, the South extreme of the island, is a cliff of red sandstone, 30 feet high, and has a rock that dries off it, and shallow water to the distance of half a mile.

Rocky and irregular soundings, 4 to 5 fathoms, run out to E.S.E. still further, and therefore a large ship, at night or in thick weather, should not round the point in less than 9 or 8 fathoms.

Off the West side of the island, a bank, with from 3 to 5 fathoms, extends to the distance of 1¼ mile; and further to the Westward there are dangerous shoals, which, together with Boughton Spit, and the Mosquito Sands, extend along the N.E. shore of the bay nearly to Maitland Point at the entrance of the Cardigan. There are narrow and intricate channels between these shoals and the land to the Northward, which lead into Launching Bay. Large ships should not stand into less than 5 fathoms at low-water on this side of the bay.

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

Boughton or Grand River. BOUGHTON OR GRAND RIVER, 5 miles N.N.E. from Boughton Point, has a dangerous bar of sand one mile out from its entrance, and over which 6 feet, at low-water, ordinary spring-tides, can be carried in a very narrow channel marked out by 3 buoys.

Little and Fortune Rivers, Rollo Bay and Colville River. LITTLE RIVER, FORTUNE RIVER, ROLLO BAY, AND COLVILLE RIVER, occurring in order as we proceed along the coast to the N.E., are tide inlets nearly barred up with sand, and having small streams at their heads; they are places only fit for small craft and boats, having from 3 to 5 feet over their bars at low-water.

Colville Bay. There is good anchorage in Colville Bay with off-shore winds. Sharp cliffy head-lands and points of red sandstone separate the bays in which these rivers are situated, the cliffs being from 25 to 50 feet high, and the shallow water off them not extending beyond the distance of 300 fathoms, excepting at Eglington Point, (separating Bay Fortune from Eglington Cove,) where the reef is very shallow for the first 400 fathoms out from the shore, and continues 600 fathoms further, withfrom 3 to 4¼ fathoms, over rocky bottom; but this is within the line joining Howe Point and Souris Head, and therefore out of the way of vessels running along the coast. To the Eastward of Colville Bay the coast is bold and free from danger, excepting Harvey Reef, which extends 400 fathoms from Harvey Point, and has on it Shallop Rock, which always shows. Harvey Point is 5 miles from Colville Bay, and will moreover be known by its being the Eastern point of Harvey Cove, in which there are some very remarkable and high sand-hills. At Basin Head, one mile further to the Eastward, the cliffs terminate, and sand-hills and sandy beach form the shore nearly all the way to the East Point, a distance of nearly 9 miles.

Harvey Reef and Shallop Rock.

East Lake. In this distance the East Lake is all that requires notice. It is a shallow and narrow pond, within the sand-bars, extending from Basin Head to within two miles of the East Point, and having a narrow outlet (two miles from the Head), which is nearly dry at times at low-water. Boats and small craft enter it for produce, the country being well settled along its Northern shore. It is high-water, full and change, at 8½ hours, and the rise is 3¾ feet in spring tides, and 2½ feet in neap tides.

Tides.

East Point. THE EAST POINT is a cliff of red sandstone from 30 to 60 feet high, from which a reef runs out two-thirds of a mile to 3 fathoms, and not quite a mile to 5 fathoms. In vessels approaching this reef at night, it should be remembered that the flood-tide comes from the Northward, setting strongly upon and over it, and afterwards South-westward, between it and Milne Bank, at the rate of 2½ knots. There is frequently a great rippling off the point, but the reef does not extend further than has been stated. The depth of 20 fathoms is as near as a large ship should approach when the land cannot be seen at night or in foggy weather. The anchorage is not good to the Northward of the point, the ground being either loose or rocky; but to the Southward of it there is good riding with Northerly winds as far Westward as the East Lake Outlet, in a moderate depth of water, and over a bottom of red sand. The tides run at the rate of 2½ knots between the North end of Milne Bank and the point, but are not nearly so strong further to the Westward.

Milne Bank. MILNE BANK, if we consider it to be bounded by the depth of 10 fathoms, is 5¾ miles long, N.N.E. and S.S.W., and 1¾ mile broad; the bottom being of sandstone, thinly covered here and there with red sand. The soundings are irregular, between 6

and 9 fathoms, over the Northern part of the bank; but towards the Southern end, and close to the outer edge, there is a shallower part, 1½ mile in length, on which there are less than 5 fathoms; and it is here that the least water is found, namely, 4½ fathoms at low-water, in spring tides. This shallowest part of the bank lies between S. by E. and South from the East point, and is distant from it 4¾ to 5¾ miles. Souris Head and Dean Point in one, bearing W. by N., pass over its N. extreme in 5 fathoms; and Swanton and Chepstow Points, bearing W.N.W. ½ W., just clear it to the Southward in the same depth; but those points are so distant, that fine weather, and a person very well acquainted with the coast, would be required to distinguish them. The extreme South end of the bank, in 10 fathoms, bears from the East Point South 6¼ miles; and the North extreme E.S.E. 2 miles. Between the Northern part of the bank and the East Point there are from 10 to 11½ fathoms, red sand bottom, the deepest water being close to the bank. The Eastern or outer edge of the bank is very steep, there being from 12 to 15 fathoms close to it, and there is very frequently a great rippling along it, caused by the abrupt opposition which it presents to the flood-tide from the North-east. The sea is very heavy here, and also off the point, in strong N.E. gales.

THE NORTH COAST OF PRINCE EDWARD ISLAND.

The great bay formed by the Northern coast of Prince Edward Island, and the difficulty of beating a ship out of it in heavy and long-continued N.E. gales, has been already mentioned. That difficulty seems to be caused by an acceleration in the rate of the current so frequently found running past Cape Gaspé, Bonaventure Island, and the Miscou Banks, and which doubtless continues further South: or it may arise from an extension of that general set to the Southward so often experienced by vessels crossing from the Bird Islands towards Anticosti or Cape Rozier, and which has been observed to be increased by strong N.E. winds; as might have been inferred from the great rise of water which they cause in all the Southern ports of the Gulf. *Currents.*

The set of the tidal streams may also at times be very unfavorable to a vessel under the supposed circumstances, for the stream of flood is known to set to the Southward into the bay, in conformity with the progress of the reflux tide-wave, from the North Point South-eastward to St. Peter's, whilst further Eastward the tide that comes from the N.E., from between the Magdalens and Cape Breton, also sets towards the shore, especially near the East Point. *Tidal Streams and Tides.*

The reflux course of the tide-wave on this coast, has been inferred from observations made during the surveys of all the harbors; from which it appears, that the time of high-water on the full and change days becomes later in succession, as we proceed South-eastward from the North Point to Cascumpeque, Malpeque, Grenville Bay, Rustico, Tracadie, and St. Peter's. At St. Peter's the time of high-water, full and change, namely, 8¾ hours, is rather later than at the East Point; and as there is also a considerable increase in the rise of the tide, there seems reason to conclude that the two tide waves meet somewhere about this harbor, the Western being twelve hours older than the Eastern wave.

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

From the North Point to Cape Kildare, 11 miles S. by W. ½ W., there is little requiring notice, excepting the River Tignish, 2 feet deep in its narrow sandy entrance at low water, and affording shelter to fishing boats; and where also there is a Roman Catholic church and settlement, principally of Acadians. About a mile to the Northward of the entrance a rocky ledge runs off to the distance of 1⅓ mile, with no more than 3 fathoms at low-water. *Tignish River.*

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

CASCUMPEQUE HARBOR, sometimes called Holland Harbor, is distant 5 miles S.W. ¼ W. from Cape Kildare, and at the bottom of the bay, where the land begins to trend to the Eastward. It will be known also by the very remarkable high sand-hills, 3½ miles to the Southward of its entrance; these are the remains of a range of sand-hills formerly known as the Seven Sisters, and are 50 feet high. There are no high sand-hills to the Northward of the harbor. *Cascumpeque Harbor.*

The entrance is 180 fathoms wide, between two sand-bars resting upon the sandstone which forms the Inner Bar, over which there are 10 feet at low-water. The Outer Bar, of sand, lies 1¼ mile out from the entrance, and has the same depth, namely, 10 feet at low-water, in a very narrow channel, indicated by a white beacon, (on the South extreme of the Northern sand-bar,) in one with a white mark on a log hut, bearing W. by N.

The channel, from the one bar to the other, and between sand covered by only a few feet of water, is 100 fathoms wide, and affords tolerable anchorage in from 2½ to 3½ fathoms, sand bottom; the best berth being just outside the entrance, where the sands on each side dry at low-water.

Tides. It is high-water at the beacon, on the full and change days, at 5h. 40m. after the moon's transit; and the rise in ordinary spring-tides is 3 feet, and in the neap tides 2 feet; but this is not regular, and therefore 12 feet over the bar at high-water is all that can be safely reckoned upon on any particular day; unless in strong Easterly winds, which cause a rise of a foot or more in all the harbors of this coast.

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

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

At or near the neaps, the two tides of the same day become nearly equal in time, and rise for a short time. There is reason to believe, that the diurnal inequality of the tides ceases for a time soon after the equinox, and that it is reversed in winter, but the ice has hitherto prevented observations during that season. These remarks apply to all the harbors of this island, and of the neighboring provinces: their importance to vessels seeking refuge and taking the dangerous bars in bad weather will be evident. The rate of the tidal streams in the entrance of Cascumpeque Harbor is in general 1½ knot, and it seldom if ever exceeds 2 knots.

A pilot would be indispensable to a stranger visiting this place for the first time. I shall therefore only observe, that the white mark on the house must not be opened in the least to the Northward of the beacon, since those objects in one lead in close along the Southern edge of the Northern sand. In strong Easterly gales the bar is covered with a continuous line of heavy breakers.

There is good anchorage off it in fine weather, of 5 or 6 fathoms, sand bottom. Within the entrance, the harbor has plenty of water, and a clear channel, which, after running in one mile to the Westward, turns to the Southward within Savage Island, and between it and Hill's Point, where there is a wharf at which vessels generally load.

Cascumpeque Bay. CASCUMPEQUE BAY is of great extent, and broken into inlets or rivers which penetrate the country in a variety of directions, and to the distance of many miles.

Richmond Bay. RICHMOND BAY is of great extent, running in 10 miles to the S.W., and crossing the island to within 2½ miles of the waters of Bedeque harbor. It contains seven islands, and a great number of creeks or rivers, some of which are navigable for vessels of considerable burden, and all of them by small craft and boats. Grand River, which is the principal inlet, can be ascended in boats to the bridge, a distance of 7 or 8 miles.

Grand River.

Malpeque Harbor. MALPEQUE HARBOR is very superior to any other on the Northern coast of the island, having 16 feet over its bar at low-water, and from 18 to 19 at high-water in ordinary spring-tides, together with depth and space enough within for any description and number of vessels. The principal entrance is to the Southward of Billhook or Fishery Island, and between it and Royalty Sand, which dries out a long half-mile from Royalty Point.

The ground is good, in the usual anchorage, just within this entrance; the bar outside preventing any sea from coming in, and the Horse-shoe Shoals sheltering them from Westerly winds down the bay. The other entrance, to the N.W. of Billhook Island, is called the WEST GULLY, and is so narrow and intricate as to be only fit for boats, or very small craft, although it has a depth of 9 feet over its dangerous bar of sand, which is 1¼ mile out from the shore. There will be no probability of this being mistaken for the main entrance, even if the beacons and buoys were gone, if it be remembered that the Main or Ship channel is to the S.E. of all the sand-bars, including Billhook Island, and between them and the red sandstone cliffs of Cape Aylesbury, the S.E. point of the bay.

West Gully.

Malpeque Bar. THE BAR OF MALPEQUE runs out from Billhook or Fishery Island 2¼ miles to E. by S., and then turns to the Southward so as to join the shore to the Eastward of Cape Aylesbury. It is of sand thinly and irregularly spread upon sandstone; the rock being in many places quite bare. It is exceedingly dangerous in bad weather, when all signs of a channel are obliterated by heavy breakers. The Northern part of the bar, to the distance of 1½ mile out to the Eastward from Billhook Island, is very shallow, there being in some places only 4 feet at low-water; but the extent of this shallow part is well shown by a good cross-mark, namely, the Scotch church, Malpeque, and

Darnley Point in one, bearing S.W. by S. To the Eastward of this cross-mark, and to the Northward of the line of the beacons, there is more than 12 feet at low-water.

Ship Channel.

The narrowest part of the ship-channel is just within, or to the Westward of the above-named cross-mark, and is one cable wide, and 4 fathoms deep. The Inner Bar, of sandstone, and with 19 feet at low-water, is a quarter of a mile further in, and has in general a buoy upon it. The two white beacons, on the S.E. end of Billhook Island, kept inone, bearing W.N.W. ¼ W., will lead through the narrows of the ship-channel and over the inner bar; but not over the outer bar in more than 13 feet at low-water. To enable vessels to cross the outer bar in the deepest water, namely, 16 feet at low-water in ordinary spring-tides, the outer buoy is moored in 3¼ fathoms and at the distance of one cable to the Northward of the line of the beacons: the intention being, that a vessel by running from the outer to the inner buoy should carry the deepest water, but I do not think that more than 15 feet could be insured in that way, or without the assistance of a third buoy between the other two; and therefore a stranger without an experienced pilot, should not reckon upon more than that depth. As the buoys are at present so insecurely moored as to be liable to drift from their positions, the directions I shall give will be irrespective of them, as follows:—

Directions.

Being off the bar, in 5 fathoms, bring the beacons in one, bearing W.N.W. ¾ W.; then sheer to the Northward of their line to the estimated distance of one or two cables, and the Westmost beacon will appear a little to the Northward of the other. Steer now so as to make a direct course towards the beacons, keeping the Westmost beacon open a little to the Northward, and the vessel will pass the bar in not less than 15 feet, and probably in 16 feet at low-water in ordinary spring-tides, or a corresponding depth at other times of the tide.

The water will deepen immediately within the bar to 18 feet or more, and as soon as it does so sheer at once to the Southward, and bring the beacons exactly in one, taking care that this be done before the Scotch church, Malpeque, opens out to the Westward of Darnley Point; for if not the vessel will be on shore on the shallow part of the bar on the North side of the channel. Keep now the beacons in one, running towards them, and they will lead through the Narrows, and over the inner bar, in 19 feet at low-water; after which they may either still be kept in one, or the Westmost one a little open to the *Southward* of the other, until the vessel is half a mile within the inner bar, or within three-quarters of a mile of the beacons, when the course must be changed to West, and the sandy South point of Billhook Island must be passed at the distance of one cable, steering that course into the harbor.* The vessel should anchor with the beacons bearing between E. by N., and E.N.E., and distant from one-quarter to three-quarters of a mile, but not further for fear of the Horse-shoe Sands, which commence at the distance of one mile from the beacons. There is less sea further to the S.W., within or to the Westward of Royalty Sand, but a stranger will have less difficulty and risk in taking up the berth first recommended. The channel passes to the Southward of the Horse-shoe Sands and between them and Grover Island, but the principal object aimed at in these directions being to enable a vessel to run into a place of safety, I shall refer to the chart for the navigation within the bay. Vessels may anchor outside the bar, in from 5 to 7 fathoms, sand bottom, to wait for a pilot; and in the event of the wind or tide failing, the anchorage is considered tolerably safe between the inner bar and the entrance, and probably is so with any wind that would prevent a vessel from running in, but the holding-ground is not good there, and should only be trusted in fine summer weather. Within the harbor the bottom is of sand and clay, and a vessel may choose any depth from 3 to 10 fathoms, the greatest depth being close off the point of Royalty Sand.

Tides.

It is high-water in the harbor, on the full and change days, at 6 hours after the moon's transit; the rise being 3 feet in spring, and 2 feet in neap tides: but the rise is so irregular, that it would not be safe to count upon a rise of more than 2 feet on any particular day. N.E. winds cause high tides, Westerly winds produce the the contrary effect. The morning tides are the highest during the summer months. The rate of the tides is strongest in the entrance, and off the point of Royalty Sand, running in spring tides 2 ½ knots. In the ship-channel, from the entrance to the bar, the rate is 1½ to 2 knots. Within the bay the tides are in general much weaker, seldom amounting to one knot.

The coast between Richmond Bay and Cape Tryon is nearly straight, and free from detached dangers; but the shallow water runs out a considerable distance, and a large ship should not approach nearer than the depth of 7 fathoms.

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

Cape Tryon. CAPE TRYON, distant 7 miles, S.E. ½ E. from Cape Aylesbury, is a remarkable cliff of red stone, 110 feet high.

Grenville Harbor. GRENVILLE HARBOR, 1½ mile S.S.E. from Cape Tryon, has its entrance at the North-western extremity of a long range of sand-hills, the highest of which is 55 feet above high-water mark. The entrance of this harbor is one-third of a mile wide, and 3 fathoms deep, but it is nevertheless only fit for small vessels, in consequence of its dangerous and shifting bar of sand, which is only 5 feet at low-water.

Cape Turner. CAPE TURNER is the highest cliff on the island, being of red sandstone and conglomerate, 120 feet high. It is distant 8 miles S.E ½ E. from Cape Tryon, the harbor last described lying between.

Great Rustico Harbor. GREAT RUSTICO HARBOR has two narrow sandy entrances, on either side of M'Austin Island, and which are distant 3 and 5 miles respectively to the S.E. of Cape Turner. It is a place only fit for small schooners; for its shifting bars of sand are exceedingly dangerous, having a varying depth of from 4 to 6 feet, and extending out three-quarters of a mile from the shore; at which distance there are 3 fathoms at low-water.

Stanhope Point. STANHOPE POINT, on which there is a sand-hill 30 feet high, half a mile to the Eastward of the entrance of Little Rustico, and 9 miles S.E. from Cape Turner, has a dangerous reef running out from it three-quarters of a mile to the depth of 3 fathoms, and 1 mile to 5 fathoms. On some parts of this reef there is only one foot of water, at the distance of half a mile from the shore. Between Stanhope Point and Cape Turner the coast forms a curve or bay, in which are situated the entrances of the Rusticos already described; and where the 3 fathoms edge of the shallow water is seldom less than three-quarters of a mile off shore. Further out the holding-ground is bad, being of red sandstone, with an occasional thin covering of sand.

Tracadie Harbor. TRACADIE HARBOR, or Bedford Bay, is distant 4 miles from Stanhope Point, and 13 miles S.E. by E. from Cape Turner. Its entrance is at the Western extremity of a remarkable range of sand-hills, 50 or 60 feet high. The bar of sand, which shifts occasionally in heavy gales, extends out to the distance of three-quarters of a mile from the entrance, and has a varying depth of from 5 to 9 feet over it at low-water, in a channel only 40 fathoms wide.

St. Peter's Harbor. ST. PETER'S HARBOR has only 5 feet at low-water. St. Peter's will be recognized by its magnificent range of sand-hills, which, near the entrance, attain the elevation of 70 feet above the sea, and continue for several miles to the Eastward; after which there are no more high sand-hills till we arrive at Surveyor's Inlet, within 4 miles of the East Point.

East Point. From St. Peter's to the East Point, a distance of 33 miles E.S.E., the coast is unbroken, formed of red sandstone cliffs, with occasional patches of sandy beach at the mouths of small streams, where boats can land only in fine weather, or off-shore winds.

NORTHUMBERLAND STRAIT.

A full description of Prince Edward Island, and of the opposite coasts of New Brunswick and Nova Scotia, having been given in illustration of the Admiralty charts. It now only remains to offer a few general remarks respecting the Strait of Northumberland, which appears to have been hitherto avoided by large ships, as much from a want of that precise knowledge which a good chart and directions are calculated to convey, as from any supposed amount of danger or difficulty in its navigation. There are, however, few places in which such precision of knowledge is more requisite than in this strait, which presents a confined navigation 160 miles in length; and which at Cape Tormentine, the narrowest part, is only 7 miles wide from shore to shore; and only 5½ miles, if we reckon only the navigable breadth between the shoals.

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

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

Tidal Streams. For the purpose above stated, it will be convenient to divide the strait at Cape Tormentine into two nearly equal portions, distinguished by the different set of their tidal streams, and by different tide-waves, which advancing from opposite directions, meet in the central part of the strait. The course of these waves appears to be as follows:—The principal tide-wave, after entering the Gulf between Cape Breton and Newfoundland, sends off, laterally, waves to the S.W., on either side of the Magdalen

Islands. The first of these, which I shall call the Eastern wave, coming from between those islands and the Western shore of Cape Breton Island, arrives at the Eastern entrance of the strait soon after 8 o'clock, and proceeds to the Westward, making high-water later in succession from East to West as far as Pictou, which it reaches at 10 hours. At the same nominal hour, but 12 hours later, the other or Western wave arrives at Cape Tormentine, having been retarded by the long detour which it has taken to the Northward and Westward of the Magdalens, and by the great extent of comparatively shallow water which it has passed over in its subsequent progress to the S.W. This wave makes high-water later in succession at places along the Eastern coast of New Brunswick, as we proceed to the Southward; and, after entering the strait, from N.W. to S.E., contrary to the course of the other or Eastern wave.

Thus, it is high-water on the full and change days at Miscou at about 2½ hours; at Point Escumenac and the North Point of Prince Edward Island, forming the Western entrance of the strait, soon after 4 hours; at the West point of Prince Edward Island at 6 hours; at Schediac, 8 hours; and at Cape Tormentine, 10 hours.

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

The direction of the tidal-streams corresponds generally, and in fine weather, with the progress of the tide-wave, but is disturbed occasionally by strong winds. The Eastern flood-stream enters the strait from the N.E., running at the rate of 2½ knots round the East point of Prince Edward Island, but is much weaker in the offing and over towards the Southern shore. It runs round Cape Bear, and with an increasing rate along the land to the Westward; is strongest in the deep water near the land, and runs at its extreme rate of 3 knots close past the Indian Rocks and Rifleman Reef.

Losing strength as it proceeds further to the N.W., it is quite a weak stream when it meets the other flood-stream off the Tryon Shoals.

This Eastern flood-stream is not so strong along the Southern or Nova Scotian shore, unless it be in Caribou Channel for a short space near Caribou Reef; and it is weak, not generally exceeding half a knot in the middle of the strait.

The other or Western flood-stream comes from the Northward, along the West coast of Prince Edward Island, sweeping round the West Point, and running strongest in the deep water near the West Reef, where its rate is 2½ knots. Over towards the New Brunswick shore its rate seldom exceeds 1½ knot, and this is its average rate as it pursues its course to the S.E., until we arrive near Cape Tormentine, where the strongest part of the stream runs near the Jourimain Shoals, and thence to the Southward round and over the dangerous Tormentine Reefs, with a great ripple, and at the rate of 3 knots.

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

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

The tidal-streams were observed in general to change their direction soon after it was high-water or low-water by the shore; but not unfrequently there were exceptions to this, which it would be difficult to account for with certainty. Strong winds in the Gulf greatly influence the strength and directions of the streams in the strait, as well as the height to which the tides rise; moreover, as the two tide-waves that meet in the central parts of the strait are 12 hours different in age, so they are in consequence of unequal heights, owing to the diurnal irregularity; each of them being alternately and in turn the highest, and probably occasioning the stronger stream.

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

Directions.

Vessels bound to Miramichi, and the ports in the strait to the Westward of Cape Tormentine, after entering the Gulf on either side of the Island of St. Paul, usually

pass to the Southward of the Magdalens, and round the North Point of Prince Edward Island. The reef of this last-named point is exceedingly dangerous, and the lead should be kept constantly going when approaching it at night, or in foggy weather; bearing in mind the probability of having been previously set to the Southward in crossing from the Magdalens, especially if the wind has been from the Northward.

Under the same circumstances, after rounding the North Point, the course should be shaped well to the Westward, so as to insure clearing the West Reef, which should be passed by the lead, running along the edge of the bank off the New Brunswick shore. Proceeding South-eastward, after having passed the West Reef, the lead will afford sufficient guidance along either shore, reference being had to the soundings in the Admiralty chart, until we arrive near the narrow part of the Strait at Cape Tormentine.

There, if the vessel be bound further to the Eastward, the shore of Prince Edward Island should be preferred, the soundings on that side being quite sufficient to guide the vessel past Carleton Head, Cape Traverse, and more particularly the Tryon Shoals, if the irregular tides off the latter, and the frequent set of the ebb-stream towards them be remembered. The tides, however, in this narrow part of the strait, are not very strong along the Prince Edward Island shore, off which the anchorage is good, in the event of the wind failing; whilst on the opposite side there is deep water, and very strong tides close to the Jourimain and Tormentine Reefs.

If the wind be adverse, or scant from the Southward, with the ebb-tide running, a stranger had better not attempt this narrow passage at night, or when the land cannot be seen. Under such circumstances, it is recommended to anchor to the Westward of Cape Tormentine, till daylight or a change of tide renders it less hazardous to proceed. Vessels bound to ports in the Eastern division of the strait, enter the Gulf either through the Gut of Canso or by the Island of St. Paul. In the first case, the bearing of the light at the Northern entrance of the Gut will guide them up to Cape George, from which, if bound to Pictou, there will be no difficulty in running along the land to the Westward, if due attention be paid to the soundings in the chart, and afterwards to the bearing of Pictou light. If the weather be thick, or the light not seen, beware of the reef off the East end of Pictou Island, which should not then be approached nearer than the depth of 10 fathoms, especially if the flood-tide be running.

Vessels approaching from St. Paul's, and entering the Strait at the East point of Prince Edward Island, should not approach the latter nearer than 20 fathoms in dark nights or thick weather.

Cape Bear and its reef should not be rounded in less than 15 fathoms, under the same circumstances; and then, if bound anywhere to the Westward of Pictou, the vessel should be kept more over towards Pictou Island and the Southern shore, where the soundings will guide her, till the Indian Rocks and Rifleman Reef are passed. The light on Point Prim will greatly assist in passing the last-named danger, after which the lead will again afford sufficient guidance along the Prince Edward Island shore, past the Tryon Shoals, and through the Strait to the North-westward.

On the opposite or Nova Scotian shore, Westward of Pictou, the principal dangers to be avoided are the Middle Shoals, between Pictou Island and Caribou, Amet Island and shoals, and the Waugh Shoal. The approach to all these is sufficiently indicated by the soundings, and therefore a constant use of the lead, and a careful reference to the Admiralty chart, will enable the intelligent seaman to pass them at all times in safety; and also to conduct his vessel to any of the harbors of the coast, where pilots will readily be obtained.

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

CAPE GEORGE BAY, THE GUT OF CANSO, AND THE LENNOX PASSAGE.

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

* See Chart.

MAC ISAAC ROCK, with 9 feet least water, is the centre of a small detached shoal, distant nearly 300 fathoms from the shore, between Mac Isaac Point and a remarkable patch of white gypsum cliff. This rock, which is the only danger on the West side of the bay, bears from the gypsum patch E.N.E. ½ E., two-thirds of a mile: it is distant 2¼ miles to the Northward of Antigonish, and is shown occasionally by heavy breakers. *Mac Isaac Rock.*

ANTIGONISH HARBOR, 11 miles S.S.W. from Cape George, and midway between Mac Isaac Point and Monk Head, is 90 fathoms wide at entrance, between low points of sand, from which a dangerous bar extends to the distance of half a mile. Two Beacons, on the Northern point of entrance, kept in one, and bearing W. by N. Northerly, led over this bar, at the time of our survey, in 6 feet at low-water; but both the depth and direction of the very narrow channel are said to change occasionally. The anchorage off the bar is not very good, and would be quite unsafe in a gale of wind from the N.E. It is high-water in the entrance, on the full and change days, at about 9 hours; the rise being 4 feet in ordinary spring-tides, and 2 feet in neap tides. Northerly winds cause high tides, and Southerly winds the contrary. The rate of the tides in the entrance seldom exceeds 2 knots, unless it may be in spring, after the melting of the winter snow. *Antigonish Harbor.* *Tides.*

MONK HEAD is a cliff of gypsum 45 feet high, 2¾ miles S.E. from the entrance of Antigonish Harbor. It has a rocky bank, with 3 fathoms least water, extending off it three-quarters of a mile to the Eastward; and there are no more than 4½ fathoms at double that distance out from the shore. *Monk Head.*

POMQUET HARBOR has its narrow entrance at the Eastern extremity of a range of low sand-hills and sand-beach, 2½ miles S.S.E. from Monk Head, and in the bay between it and Pomquet Point. It is an extensive place, branching into two principal and many smaller inlets, coves, and islets. It is navigable for small craft and boats nearly 3 miles in from the sea, but it is of no use to shipping, having usually only a depth of 2 feet at low-water over its shifting bar of sand. The principal settlements and the Roman Catholic church are on the Western shore of the N.W. arm. *Pomquet Harbor.*

POMQUET ISLAND, which bears S. ½ E., distant 14¼ miles from Cape George, is of red sandstone, low, wooded, about half a mile long, and is joined by a reef to Pomquet Point, from which it is distant 175 fathoms. The reef dries out from the point more than half way over towards the island, and leaves a passage only 3 or 4 feet deep at low-water. Shallow water runs out from the island nearly 400 fathoms to the E.N.E., and a reef, with a large rock near the end of it, dries out from its Eastern shore to the distance of 150 fathoms. The island and its reefs shelter Pomquet Road from all points excepting between N.E. by N. and East. This roadstead, which is considered safe during the summer months, but where the riding must be very heavy in N.E gales, is in the bay between Pomquet Point and Little River; which last admits boats only at high-water, and with its English church and settlement will be seen bearing S. by W. at the distance of a long mile from the island. Vessels may anchor in any depth from 3 to 6 fathoms, over sandy bottom; but the best sheltered berth is in 4 fathoms at low-water, with the South point of the island bearing N. by E. ½ E., distant half a mile. To run for this anchorage from the Northward, pass the Eastern shore of the island at the distance of half a mile, or in not less than 8 fathoms, until Pomquet Point comes in sight to the Southward of the island, when haul to the Westward into the bay. Approaching from the Eastward, the Bowman Bank must be avoided in a large vessel, either by the lead, or by not bringing the North point of the island to bear to the Westward of W.S.W. until the North point of the bank is passed. The bank is of great extent, running off fully 2 miles to the Northward from Quarry Point and Bowman Head; and has rocky patches on it, with 13, 16, and 19 feet at low-water, at various distances, from three-quarters to 1½ mile off shore. *Pomquet Island.* *Bowman Bank.*

THE POMQUET BANKS, discovered by Captain Bayfield, lie off Pomquet Island to the N.N.E., distant from 3 to 6 miles. The soundings on them are rocky and irregular, the least water (6 fathoms) having been found on the outer and smaller of the two banks, when the church at Little River was shut in behind the East side of the island, bearing S. by W. ½ W., 5½ miles. *Pomquet Banks.*

TRACADIE HARBOR,* 3¾ miles E.S.E. from Pomquet Island, has its narrow entrance about half a mile to the Eastward of Bowman Head. It is extensive, and 14 feet deep in some parts within; with many coves, islets, and small streams, the principal of which, called Tracadie River, is at the head of the Eastern arm, 2½ miles in from the sea. The depth over its dangerous bar of gravel and stones is only 2 feet at low-water, in a narrow and crooked channel; it therefore only admits boats or very small vessels at high-water. The village of Tracadie and the Roman Catholic church will be seen about a mile within the entrance. The church is large and can be seen from a great distance out at sea. *Tracadie Harbor.*

* See Plan.

Little Tracadie. LITTLE TRACADIE, a similar but much smaller harbor, with only one foot at low-water over its bar, lies 2¾ miles further to the Eastward. Its entrance is in the bay between Barrio Head and Blue Cape, the former being a cliff of red sandstone 110 feet high; the latter remarkable from being of limestone, and sheltering the entrance from N.E. winds.

Cape Jack. CAPE JACK, a cliff of red sandstone, 45 feet high, is the most prominent headland on this part of the coast, forming the extreme point all the way from Pomquet Island, from which it bears E. ¾ S. 7¾ miles.

Jack Shoal. JACK SHOAL runs out from the Cape N.E. by N. 1 mile to 3 fathoms, and 1½ mile to 5 fathoms. Between the distances of half and three-quarters of a mile off shore, there are two large patches of rock, that dry at half tide; leaving a passage for small craft, 11 or 12 feet deep, between them and the cape. This shoal has often proved dangerous to vessels in thick weather, when it should be approached with great caution, especially from the Eastward; soundings on that side being irregular and deep near the shoal, but nevertheless quite sufficient to insure safety, if the lead be kept going, with reference to the Admiralty chart. On the outer point of the shoal in 3 fathoms, the light-house at the North entrance of the Gut of Canso bears S.E. ½ E. 3½ miles; therefore a vessel will be clear of this danger if the light be not brought to bear to the Eastward of S.E. ½ S. If the light cannot be seen, the shoal should not be approached nearer than the low-water depth of 10 fathoms.

Havre Bouche. HAVRE BOUCHE is a small but convenient harbor for schooners, lying between Cape Jack and the light-house. It has 4 feet, at low-water, in its narrow entrance between stony points, having no bar outside; and it is 13 or 14 feet deep within. There is a small stream at its head. The shores and neighborhood are well cultivated, and the Roman Catholic church will be seen near the shore, and a mile to the Westward of the entrance, being half-way towards Cape Jack.

Tides. It is high-water, on the full and change days, at this, and the other three small harbors last described, at about 9½ hours, and the rise, unless increased by Northerly winds, is from 4 to 2 feet, accordingly as it may be spring or neap tides.

Canso Light. The light-house at the North entrance of the Gut of Canso stands on the Western or Nova Scotia shore, 50 fathoms within the high-water mark. It is a square building of wood, painted white; standing on the bank so that the lantern is elevated about 110 feet above the sea. It exhibits a fixed light. Half a mile to the S.E. of the light-house, and on the same side of the Gut, there is tolerable anchorage in all but Northerly winds.

Vessels frequently stop there and wait tide.

The approach in this direction, through George Bay, is unattended with difficulty or danger, excepting where fogs or snow-storms hide from view the light that has been judiciously placed at its Northern entrance. The soundings are then the only guides, and they will be found sufficient, in all ordinary cases, for the safety of vessels prudently conducted, with their leads going, and furnished with the Admiralty charts. In vessels so circumstanced, the endeavor should be to strike soundings on the bank off Long Point, and then to follow its edge along the shore of Breton Island, in the low-water depth of 10 fathoms, to the entrance of the Gut. It is seldom so thick, especially in a breeze of wind, but that some part of the shore will be seen before the vessel has run far after entering so narrow a strait. With a beating wind she should board off and on the same shore, until soundings are struck (in the board to the Westward, and after crossing the deep water), on the edge of the bank off Cape Jack, where, if it be night, and the fog so thick that the light cannot be seen, or if the tide be nearly done, it will be advisable to anchor, and wait for a change. The ground there is not good, but it is out of the strength of the tides, and an anchor will hold in moderate weather. The anchorage half a mile to the S.E. of the light-house, and on the same side of the channel, should be preferred if attainable; there are some spots of mud there, in which an anchor holds well in from 7 to 9 fathoms, and where the strength of the tide is not great.

Tides. The establishment, or mean time of high-water, on the full and change days, at the North and South entrances of the Gut of Canso, is 9¼ hours and 8 hours respectively. The rise at each, in ordinary spring and neap tides, is 4½ and 3 feet, but extraordinary tides may rise 6 or 7 feet, or only 2 feet, owing to the irregular influence of unknown causes: probably strong winds at a distance. The rise and fall of the tides on the shore usually continue through nearly equal periods of time, but the duration of the tidal-streams (the flood being to the Northward and the ebb to the Southward) varies from one to four hours after it is high or low water by the shore, even in the fine weather of summer; whilst in the blowing weather, so frequent on the approach of winter or in early spring, they are reported to be still more irregular, running at times in the same direction for several days in succession; but this never occurred during the survey.

The rate of these streams off Cape Porcupine, where it is most rapid, is ordinarily about 4 knots; but is increased occasionally to 5 knots by strong winds.

Eddies. At most of the anchorages, and under almost every point, there are eddies, usually running in the opposite direction to the main stream outside, but at a much inferior rate; and they render great attention necessary to insure a clear anchor.

The length of the passage through the Gut of Canso, from the light-house at the North entrance to Eddy Point, is 14½ miles; and its least breadth, between Balache Point and Cape Porcupine, is 450 fathoms. The depth of water in the channel is seldom less than 15 fathoms, and in the deepest part, off Cape Porcupine, amounts to 32 fathoms. This great depth, the strength of the tides, and the rocky or gravelly bottom, render the anchorage unsafe, excepting at the places hereafter to be described.

Ghost Beach. Excepting at Ghost Beach, and for a short distance below Ship Harbor, the general character of the shore on either side is high; the land rising from it, more or less abruptly, to the summits of ridges of considerable elevation.

Cape Porcupine. CAPE PORCUPINE, a precipitous headland on the Western shore, 640 feet high above the sea, is the most remarkable feature, and the scenery in its vicinity is of very great beauty.

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

I shall now describe the dangers *within* this passage, as they occur in proceeding through it to the S.S.E.

Balache Rock. BALACHE ROCK is nearly dry at low tides, but, as it is within the line uniting Balache and Mackeen Points, it is not much in the way of vessels. It lies 100 fathoms E.S.E. from the end of Balache Point, and 50 fathoms off shore.

Madagascar Rock. MADAGASCAR ROCK, dry at low-water, lies directly opposite to the rock last described, and not quite 50 fathoms off shore under the highest part of Cape Porcupine. The rippling of the tide over this rock can in general be seen; nevertheless, its situation, off a projecting point in the narrowest part of the passage, nearly in the full strength of the tide, and at a part celebrated for sudden flaws of wind from various directions, renders it extremely dangerous, especially to strangers, who are accordingly recommended to give it a wide berth.

Dixon Rock. DIXON ROCK, reported to have only 6 or 8 feet over it at low-water, but on which we could find no less than 12 feet, bears South, distant 70 fathoms from Mackeen Point, and W. by S. 120 fathoms from the Western point of Plaster Cove, which will then appear in one with Martel's house, low down on the Eastern shore of the cove, and just outside of the bridge. This rock is very much in the way of vessels approaching or leaving the anchorage off Plaster Cove, but will be avoided if the whole of the bridge over the cove be not shut in behind its Western point.

Premier Shoal. PREMIER SHOAL, of rock and sand, with 13 feet least water, is a middle ground in the entrance of Ship Harbor. Ships may pass on either side of it, but to the Northward is the widest and deepest channel. Ship Harbor Point and the Western extremity of Pirate Island in one, bearing S.W. by S., will lead clear outside or to the Westward of this shoal, in 5 fathoms; therefore, vessels standing in towards Ship Harbor, or anchoring off its mouth, should be careful not to shut in the whole of the island behind the point.

Stapleton Shoal. STAPLETON SHOAL is rocky, and extends from Ship Harbor and Stapleton Points 150 fathoms to the S.W. and W. At that distance off shore there are only 16 feet at low-water, but the depth increases almost immediately to 5 fathoms, the edge of the shoal being very steep.

Cahill Rock CAHILL ROCK is on the opposite side of the Gut to the last, distant three-quarters of a mile to the S.E. from Holland Cove, and 60 fathoms off shore. It is dry at low-water, but becomes dangerous when covered. Roger Point in one with the N.E. side of Pirate Island, (the latter being seen over the low shingle neck of Pirate Point), and bearing N.W. ¾ N., leads clear outside of it at the distance of 60 fathoms.

Ship Rock. SHIP ROCK is on the Eastern shore, rather more than half way from Stapleton Point to Bear Head. It has 6 feet least water, and is distant a quarter of a mile Northward from Ship Point, and 70 fathoms off shore. Ship Point and Bear Head in one, bearing S.E. ½ S., lead outside of it at the distance of only 20 or 30 fathoms, and therefore, in standing towards it, tack before the head and point come in one.

Bear Reef. BEAR REEF has from 6 to 9 feet at low-water over large rocks, and extends 140 fathoms Southward from Bear Island. Off Bear Head also there is shallow water, extending 190 fathoms to the S.E. Great caution should be used in approaching these dangers, for the water is too deep near them for the lead to afford much warning, and there are no good clearing-marks.

Crossing again to the Western shore of the Gut, at Critchet Cove, there is a shallow bank of mud and sand, on which small vessels frequently anchor, but of which

large vessels should beware. Its outer edge, in 5 fathoms, is nearly a quarter of a mile off shore.

Martin Shoal. MARTIN SHOAL, 2 miles further to the S.E., and 1¾ mile N.W. from Eddy Point, is of rock, and extends 170 fathoms off shore. Melford and Critchet Points in one, bearing N.W. ¾ N., just clear its edge in 4 fathoms.

Eddy Spit. EDDY SPIT, of sand and stones, runs out a quarter of a mile N.W. from high-water mark to the N.E., and is almost always shown by the rippling of the tide. Ship Point and Bear Island in one, bearing N.W. ¾ N., just clear it to the N.E., at the distance of about a cable's length.

Eddy or Sand Point Light. EDDY or SAND POINT LIGHT.—A beacon light on Eddy or Sand Point, on the W. side of the South entrance to the Strait of Canso, and is distinguished by two white lights horizontally placed 25 feet above sea level—rise and fall 6 feet. The building is square, painted white, with a black diamond on the seaward side. The point is shoal Eastwardly of the light nearly 200 fathoms, but the Northwest of it is bold water, and good anchorage. The tides are irregular, and very rapid round the point.

The following bearings by compass may assist vessels passing through the strait:—

From the Light to Cape Hogan,	S. 50°	E.
" " to Western headland, which intercepts the light,	S. 10	E.
" " to Bear Island,	N. 32	W.
" " to Pirate Cove,	N. 34	W.
" " to Mill Creek,	N. 39	W.

Eddy Point. EDDY POINT, from which the spit extends, is of sand and gravel, inclosing a small pond.

Dangers in South Entrance. The deep channel of the Gut of Canso continues to the Southward, between Nova Scotia and Janvril Island into Chedabucto Bay, and being the course of the main stream of the tides from the Gut, as well as of all vessels that use this passage, we shall continue the description of the dangers on either side, as belonging to the same line of navigation.

Argos Shoal. ARGOS SHOAL consists of rock, and extends to the distance of two-thirds of a mile E. by N. from Cape Argos. The least water found on it was 20 feet. It is shown by heavy breakers when there is a swell from the S.E.

Cape Argos. CAPE ARGOS, distant 2½ miles to the Southward of Eddy Point, will be easily recognized, being a small but high peninsula, bare of wood, with red cliff, and united to the main-land by a low isthmus of shingle. Off the point of cliff next to the North of the cape, and distant a third of a mile from it, a reef runs off towards Argos Shoal, which it so nearly joins as to leave no passage for large vessels. Eddy Point and Flat Head touching, and in one with the East side of a hill behind the latter bearing N. by W. ½ W., clear these dangers in 7 or 8 fathoms, and at the distance of 150 fathoms to the Eastward. Flat Head is the N.E. point of Bear Cove, and if it be wished to pass outside of Argos Shoal, at a greater distance, let the above-named marks be kept proportionally open.

At Cape Argos the coast turns to the S.W. into Chedabucto Bay: we now cross to the Eastern side of the passage, where the shoals off Janvrin Island are exceedingly dangerous.

Thomas Shoal. THOMAS SHOAL runs out from Thomas Head (the N.W. point of Janvrin Island) three-quarters of a mile to the Westward, with rocky and irregular soundings, from 11 to 21 feet at low-water. The clearing-mark for the Western extremity of this shoal, is the Eastern end of Wasting Islet touching the S. end of Peninsula Point, and bearing S.S.E. ½ E.; and for its Northern side, the two points forming the North side of Janvrin Island in one, and bearing E. ½ S., when Campbell Island will appear just open to the Northward of them.

Janvrin Shoal. JANVRIN SHOAL runs out from Janvrin Point two-thirds of a mile to the Westward. This bank of sand and stones dries out half that distance, and has a large rock near its edge. At the distance of 550 fathoms out from the point there is another rock, with 6 feet least water, from which the S.W. extremes of Wasting Islet and Peninsula Point appear in one. The marks for clearing this dangerous shoal on the S.W. side, at the distance of 100 fathoms, and in 5 fathoms water, are, the S.W. side of Wasting Islet in one with the N. end of Peninsula Point, and bearing S.E. ½ E. On the N.W. side, where there are no clearing-marks, it should be approached with great caution, for the water is too deep for the lead to afford much warning.

Wasting Islet and Peninsula Point. WASTING ISLET and PENINSULA POINT, appearing like two small islands, on the edge of the bank that dries out from the S.W. side of Janvrin Island, will be easily recognized, the islet being most to the N.W. They both have low red cliffs to seaward, and long gravel spits at their North points; but a long bar of shingle unites the peninsula at its East end to Janvrin Island. The very shallow water extends only 200 fathoms off Wasting Islet, with a depth of 4 or 5 fathoms for an equal distance further out to the S.W.; but the Peninsula Point Shoals are much more ex-

tensive and dangerous, running off both South and S.E. In the latter direction the reef dries out 300 fathoms, and under water extends to double that distance; while to the Southward there are 6, 16, and 25 feet, at the distance of a quarter, a half, and three-quarters of a mile out from high-water mark. Ship Point and Bear Head in one, bearing N.W. ½ N., clear these shoals to the S.W. in 6 fathoms; and the Roman Catholic steeple at Arichat and the South extremity of Creighton Island in one, bearing E.S.E. ¾ E., will clear them to the Southward at the distance of a third of a mile.

The foregoing brief description of the dangers on either side of the channel of the Gut of Canso, is intended to illustrate and to be used with reference to the Admiralty Chart; and with the same design the anchoring-places shall now be pointed out.

Anchorages in the Gut of Canso.

Vessels may anchor for a tide, and in fine weather, near the light-house at the North entrance, as already remarked; and also off Mill Creek, which is another occasional stopping-place; but neither of these can be recommended, since they are both exposed to Northerly winds, which often commence suddenly, and send in a very heavy sea. Moreover, off Mill Creek irregular eddies render it very difficult to keep an anchor clear.

Mill Creek.

Plaster Cove.

PLASTER COVE, on the Eastern shore, and distant 5 miles from the light-house, is the first safe anchorage after entering the Gut from the Northward. It will be known at once by the conspicuous cliffs of white gypsum, which are 120 feet high on the N.W. side, and a short distance within the bridge near its entrance. The cove itself is dry at low-water, but the anchorage off its mouth is convenient and safe in all winds. In Northerly gales the swell, deflected by Cape Porcupine, causes rather uneasy riding, but it does not endanger vessels well anchored in a clear berth.

Dixon Rock.

The only directions necessary, both for avoiding Dixon Rock and choosing a good berth are, to keep the cove open, so that the whole of the bridge as well as the plaster cliffs above it, may be seen. Large ships should keep Balache Point well open, and go no further in than 7 or 8 fathoms; but smaller vessels may anchor in 4 or 5 fathoms, with mud bottom. The bottom is more and more sandy as we proceed further out towards the steep edge of the bank in 10 fathoms, after which it becomes rocky in the deep water and strength of the tide.

Tides.

The tidal-streams at this anchorage are eddies, running often irregularly, but generally in a contrary direction to the main stream in the channel, and at a rate seldom exceeding one knot. These eddies render it advisable to moor, especially in large vessels having occasion to remain some time (to water, for instance), in which case one anchor should be laid well out to the Southward in 9 or 10 fathoms water.

It is high-water here, on the full and change days, at 9h. 10m. M. T.; the rise in ordinary spring-tides being 4½ feet, and in neap-tides 3 feet; but extraordinary tides sometimes rise 6 or 7 feet, and at other times only 2 feet.

Water.

There is an excellent watering-place directly opposite this anchorage, in the bay between Cape Porcupine and Keaton Point. The post-office is at Mackeen's store on the Western side of the cove, and the mails from Sydney, Arichat, &c., to Halifax and other places, cross the Gut from thence to Mill Creek.

Ship Harbor.

SHIP HARBOR is on the same side of the channel as the anchorage last described, and 2½ miles further to the S.E. It is a large cove terminated by a bridge nearly a mile in from the sea. It is completely open to N.N.W. winds, which blow directly through the Gut, causing at times a very heavy sea, excepting when well in towards the head of the harbor, where the anchorage is quite secure, out of the stream of the tides, and in 3½ fathoms, mud bottom.

There is a fine settlement, with a Roman Catholic and a Wesleyan chapel, on the N.E. side of the harbor, together with stores and wharves where vessels may receive repairs, or winter in safety.

Premier Shoal.

Vessels of less than 12 feet draught may run in without difficulty, passing over the PREMIER SHOAL at all times; but larger vessels should prefer the channel to the North of that danger, and attend to the following directions:

Being outside the shoal, bring Cavanagh Point, composed of low sandstone and sandy beach, on the N.E. side of the harbor, to bear S.E. ½ S., when a large store built on piles, and further up the harbor, will appear in one with it, and the end of the wharf will be just in sight. Run in with these marks on until Ship Harbor Point bears W.S.W., when you will be within the Premier Shoal, and may sheer to the Southward into the middle of the harbor. The channel to the Southward of the shoal is neither so deep nor so wide as the other, but it is more convenient for entering the harbor with Southerly winds: in which case, the chart and the lead will afford sufficient guidance.

The roadstead off the mouth of this harbor, and outside of the Premier Shoal, is much frequented by vessels detained by S.E. winds, but the riding is very rough there in winds from the opposite quarter. The depth is from 7 to 9 fathoms, over sand, gravel,

and mud bottom, and the only direction necessary is to keep Pirate Island in sight to the Westward of Ship Harbor Point.

Venus Cove. VENUS COVE, on the Western shore and nearly opposite to Ship Harbor, is an excellent anchorage, especially in N.W. winds. The best berth is in 6 or 7 fathoms, with mud bottom, directly off the mouth of the cove. Macnair Point in one with Plaster Cove, and bearing N. by E., should then be distant about 200 fathoms. There is a good watering-place here, with wharfs for landing at all times of the tide; also a fine settlement, near which a small English Episcopal church has been recently erected.

Holland Cove. HOLLAND COVE is 1¾ mile further to the Southward, and also on the Western shore. The anchorage off its mouth, although deep enough, is inconveniently small for large ships; but safe and good for small vessels. The best berth, for anything larger than a fishing schooner, is in 7 or 8 fathoms, mud bottom, with Pirate Island bearing S. E. by S., and distant a cable's length.

Pirate Island. PIRATE ISLAND, small, rocky, and united to the main-land by a beach of shingle, forms the S.E. point of the above-mentioned cove; and all within it and a line drawn across to the wharfs on the N.W. side is dry at low-water, excepting a narrow boat-channel, 3 or 4 feet deep, which leads to the bridge across this cove about a quarter of a mile from its entrance.

The remaining anchorages are less secure, either from exposure to particular winds, or loose holding-ground. On the Eastern shore, off Madden Cove, and Doolan Pond, N.W. of Bear Island, and East of Bear Head, vessels frequently anchor to wait for wind or tide in fine summer weather; as they do also at Byers, Critchet, and Eddy Coves, on the opposite side of the channel. There will be no difficulty in choosing a berth at any of these with the aid of the chart.

Habitants Bay. HABITANTS BAY lies to the N.E. of the Gut, and is about 2½ miles wide at the entrance, between Bear and Turbalton Heads. In addition to the harbor at its head, it contains the two following useful anchorages: Sea-coal Bay, on the Western shore, and 1½ mile from Bear Head, will be readily known by the high cliffs of Carleton Head, which forms its N.E. point. This spacious anchorage, secure in all winds excepting those from between South and S.E., is very convenient for vessels bound in through the Gut, and detained by strong N.W. winds. The depth in the mouth of the bay is 5 fathoms, the bottom of mud, and there is no danger in the way.

Sea-coal Bay.

Turbalton Bay. TURBALTON BAY, opposite to, and distant 2 miles from the last, is a small but secure anchorage, to the Northward of Turbalton Head, and between it and Evans Island. In approaching this anchorage, the only danger to be avoided is the reef off Turbalton Head, which is partly dry at low-water, and runs out 275 fathoms to the Westward. Janvrin and Peninsula Points in one, bearing S. by E. ½ E.; or the two extreme points on the Western side of Evans Island in one, bearing N.N.E., will just lead clear of this reef in 4½ fathoms. There is no other danger in the way, excepting the shallow water extending from the shore on either side, and from the small islets in the bottom of the bay. To avoid the latter, in a large vessel, go no further in than the line of Turbalton Head and Cape Argos, touching where the depth is 4½ fathoms at low-water. With the Cape a little open to the Westward of the Head, the depth is 5 fathoms: in either case, the bottom will be of mud, and the reef will break off the swell from the Southward.

Habitants Harbor. HABITANTS HARBOR is not at present much frequented, being out of the line of general navigation; but it has space and depth of water sufficient for any number and any class of vessels, and is perfectly secure at all seasons. The Southern side of the harbor is formed by islands inclosing The Basin, in which vessels might securely winter, but of which a minute account would only confuse a stranger. Referring, therefore, to the exact graphical representation in the Admiralty chart, as far superior to any written description, it is only necessary to remark, that the channel leading into the harbor, between Long Ledge on the N.W. and Evans Island on the S.E., is nowhere less than 150 fathoms wide, from 3 fathoms to 3 fathoms on either side, and 10 or 12 fathoms deep, with mud bottom.

Long Ledge. To avoid LONG LEDGE, which is distant about 300 fathoms from Evans Island, and to run in far enough for safe anchorage, proceed as follows:—

Approaching from the S.W. through Habitants Bay, and with a leading wind, steer so as to pass the West end of Evans Island, at a distance between 150 and 200 fathoms, or by the lead in 6 fathoms; remembering that the bank on either side is very steep for vessels drawing more than 10 feet water. Follow the shore of the island round to the N.E., but approaching it at the same time very gradually, so as to pass Steep Head, its Northern extremity, at the distance of 100 or 150 fathoms. Having passed Steep Head, the vessel will be in safe anchorage, but she may go further in without danger, by simply keeping in the mid-channel as she runs towards Bumbo Island, which will be seen (small, round, with low clay cliffs) bearing E. ½ N. and distant nearly a mile from her track while passing Steep Head as just directed.

Bumbo Island.

As the vessel proceeds, the channel between Round and Freeman Islands, leading into the Basin, will be passed; and when she has arrived within a third of a mile of Bumbo Island, the main channel between it and the Indian Point, and leading into the harbor to the North and East, will appear open, as well as the entrance of Habitants River, which lies three-quarters of a mile to the Northward. The shallow water extends 100 fathoms off Bumbo Island, and the main channel, which passing to the N.W. of it, leads into the wide expanse of the harbor to the Eastward, may be followed without difficulty with the aid of the chart. It is, however, not necessary to go beyond Bumbo Island for good anchorage, as that may be found everywhere in the channel; and if the depth of water there be considered inconveniently great, the bight to the Southward of Bumbo Island, between it and Freeman Island, affords a good berth in a moderate depth of water. The tides in this harbor are weak, seldom exceeding a knot in the entrance, where they are strongest.

It is high-water, on the full and change days, at 8h. 20m.; the rise in ordinary springs being 6½ feet, and in neaps 4¾ feet. *Tides.*

HABITANTS RIVER enters the harbor from the North, and is navigable for vessels by a narrow and winding channel for several miles, while boats can ascend to the bridge, a distance of 7 miles. There are some good farms on the banks of this river; but the shores of the harbor are as yet very thinly settled, and present a very barren appearance. There is said to be workable coal at Little River, just outside the harbor's mouth. *Habitants River.* *Coal.*

With the foregoing description of the dangers and anchorages, and the aid of the Admiralty chart, it is presumed that little or no difficulty will be experienced in the passage of the Gut of Canso, either with a leading or a beating wind. In the latter case, and when bound to the Northward into the Gulf, the aim should be to gain the anchorage at Plaster Cove, and to start from thence with the turn of the tide; so as to secure a good offing in George Bay before the ebb makes. The set of the flood-stream from the Gut is nearly towards Cape George, diminishing rapidly in strength as it expands in advancing to the Northward. It is weak in the Western part of the bay, sweeping round it to the N.W., with slight indraughts towards Pomquet, Antigonish, &c. The ebb-stream will be found setting in the contrary direction. *Canso Gut, general remarks.*

On the Eastern side of George Bay, the flood-stream from the Gut is usually met by a much weaker and contrary stream of flood, coming from the N.E., along the West coast of Cape Breton. These opposing flood-streams will be found, in general, to unite somewhere off the Judique Shoals, and then to set towards the N.W. The two corresponding ebb-streams as generally diverge from about the same place; the one setting towards the Gut, with increasing strength as it proceeds to the Southward; and the other in the contrary direction, towards Port Hood. All, however, that has been said respecting these streams, must be understood as of usual, and not of constant occurrence, since they must necessarily partake of the irregularity in the strength and duration of the tidal-streams of the Gut of Canso. Nevertheless, it will be highly useful, and may materially aid the progress of the vessel, to bear in mind the usual set of these streams.

Vessels outward bound, and proceeding through the Gut to the Southward, very frequently meet a S. or S.E. wind, with its usual accompaniments of fog and rain; in which case the roadstead of Ship Harbor will be found the most roomy and convenient anchorage. Eddy Cove, from its more advanced position at the entrance of the Gut, offers, to vessels sailing with the first of a fair wind, a better chance of clearing Chedabucto Bay and the Canso Ledges before dark; but it can only be recommended in fine settled summer weather, for the ground is not good, and the anchorage is much exposed on the occurrence of a sudden change of wind. Turbalton Bay is much more secure, but it is rather small for a large and weakly-manned vessel to weigh from, in the event of a strong wind setting in suddenly from the Westward.

LENNOX PASSAGE, between Breton Island and the islands Janvrin and Madame, is very intricate, and 15 miles in length, with a low-water depth of 18 or 19 feet in the shallowest part. There are seldom less than 23 feet at high-water; nevertheless, a great part of the channel is so narrow, crooked, and full of shoals, that it would require to be well buoyed before it could be safely navigated by large vessels. *Lennox Passage.*

It is, however, a safe and convenient channel for coasting vessels; avoiding the heavy swell in Chedabucto Bay, and affording them an advanced anchorage, from which to start with a fair wind when bound out to sea. These vessels, usually not exceeding the draught of 10 or 12 feet, frequently run through with a leading wind, choosing their time of tide; but large vessels seldom attempt it, even with the assistance of some persons there who profess to act as pilots, but whose knowledge of the channel is far from perfect. It will be enough to notice very briefly the intricate parts of the channel; a written description would avail but little, and be far less effectual, than a faithful representation afforded by a chart on a sufficiently large scale; but for some distance in from either entrance, the passage is not so difficult; and as a

knowledge of the anchorages there may often prove highly useful to vessels desirous of shelter on the approach of bad weather, those places shall now be described.

Western Entrance. Macdonald Shoal.

THE WESTERN ENTRANCE between Rabbit and Janvrin Islands is a mile wide, but the navigable breadth is reduced to half a mile by Macdonald Shoal, a bed of rocks, with 5 feet least water, and extending nearly three-quarters of a mile along the Northern shore of Janvrin Island, from which it is separated by a narrow and shallow channel. This dangerous shoal, as well as the reefs off Turbalton and Thomas Heads, must be carefully avoided in entering the passage. The West end of the shoal is distant half a mile N.N.E. from Thomas Head, which in one with Janvrin Point will just clear it to the Westward. These marks are distinct and good; but when they are in one, it may be observed that a small part of Wasting Islet will be seen to the Westward of Janvrin Point, and must not be mistaken for it. In standing towards the shoal, keep the last-named point in sight, and there will be no danger. The mark for clearing the North side of the shoal is the high-water sand-beach of Strawberry Point kept open of Macrea Point, bearing E.S.E., but it is not very clearly defined, and therefore on that side the shoal should be approached with great caution, and no nearer than the low-water depth of 6 fathoms.

Anchorage.

The anchorage in this entrance of Lennox Passage is capacious and secure, in from 5 to 7 fathoms, anywhere to the Northward of Macdonald Shoal: but the best berth is off Cary Pass, at the East end of Rabbit Island, in 7 fathoms, mud; and where the main channel is a mile wide and free from danger. It is only necessary to observe, that the shallow water extends a cable's length off the South shore of Rabbit Island, and 2 cables' length off the East point of entrance of Cary Pass, where there is a rocky patch, with 10 feet least water, 150 fathoms off shore.

Campbell Island. Fish Shoal.

From the anchorage just mentioned, Campbell Island will be seen at the distance of 1½ mile to the Eastward. The navigable breadth of the passage is there reduced to 300 fathoms by Fish Shoal, which is rocky, with 10 feet least water, and lies a quarter of a mile off a small cove of Breton Island. From thence the passage becomes intricate. The following leading-marks, with brief directions, will enable any person, who can recognize the objects named, to take a vessel through with a fair wind.

Approaching from the Westward, and before arriving at Fish Shoal, open out Burnt Point a little to the Southward of Low Point, bearing E. ¼ N.; keep them so, and they will lead to the Southward of that shoal, and for a mile further to the Eastward. When Thorn Island is just about to disappear behind Glasgow Point, bearing S.S.W. ¾ W., change the course, and steer E.S.E., or towards Martinique Cove, where there are several houses, until Burnt and Seal Islands close and appear to touch, when they will bear E. ½ N. These last-named points kept exactly touching, will lead through between the shoals as far as Burnt Point, where the channel turns to the N.E., between that point and the Burnt Islands, and where the deep water is only half a cable wide. Passing midway through this narrow opening, and with the aid of the chart, rounding the Burnt Islands to the N. and E., steer S.E. between them and Seal Island, until the Eastern point of Burnt Island comes in one with Heron Point, about W.S.W. ¼ W.; then change course instantly to E.N.E. ¾ E., keeping the last-named points astern and exactly touching, and they will safely lead through between the Middle Ground and Seal Island, where the channel is again only half a cable's length wide. The Middle Ground is rocky, with 4 feet least water; and when the channel between it and Seal Island is fairly entered, steer half a point more to the North, E.N.E. ¼ E., or so as to keep Heron Point only just shut in behind the Eastern point of the Burnt Islands, until Grande-digue Point (the *land*, not the shingle-spit) and Hawk Islet are touching, upon the bearing of E.S.E. ¼ E. Now keep to these last-named marks, and they will lead to the excellent anchorage off the Ferry at Grande-digue, where there is room enough for the largest ships in from 5 to 8 fathoms, mud bottom. The long Spit of Shingle, from which the name is derived, runs out from Grande-digue Point 180 fathoms across the channel, to about N.E. by N., and shelters the anchorage completely from the Eastward. A great part of the spit is covered at high-water, but can generally be discerned by the rippling of the tide. The only other danger here is the Ferry Reef, which lies to the N.W. of the spit, leaving a deep and clear channel, 200 fathoms wide. This reef is nearly dry at low-water, and very much in the way here, as it may be said to extend half-way across the passage, being separated from the Northern shore by a channel so narrow as to be only navigable by boats or very small craft. On the Southern edge of this reef, and also on the Northern extremity of Grande-digue Spit, Birch and Ouetique Islands are just touching, on the bearing of E. ½ S.; and therefore, to clear the reef, keep Ouetique Island *open;* and to clear the spit, partly *shut* in behind Birch Point. The ship-channel, after passing to the Southward of the Ferry Reef, turns to the N.E., between it and Grande-digue Spit, and then round the latter to the East and South, forming a crooked, and, for a stranger, a difficult pass. At Grande-digue there are extensive

Middle Ground.

Grande-digue Road.

Ferry Reef.

Grande-digue.

gypsum quarries, several tolerable farms, and the ferry by which the mail crosses the passage, on its way to Arichat.

It is high-water, on the full and change days, at Grande-digue at 7h. 55m., mean time; the rise at spring tides is 6½ feet, and at neap tides 4½ feet. The tidal-streams are often irregular, but when not so, change about three-quarters of an hour after high and low water by the shore; the flood coming in from the Eastward, they are stronger round the spit at Grande-digue than in any other part of the Lennox Passage; but their rate, even there, seldom exceeds 2 knots. *Tides.*

With a beating wind, an intimate knowledge of the place and the set of the tides is indispensable; but to run through the Narrows at Grande-digue to the Eastward, with a fair wind, proceed as follows:

Approaching the anchorage at Grande-digue from the Westward, steer for Grande-digue Point and Hawk Islet touching, as already directed, until the South point of Cascarette Island opens out a very little to the Southward of Birch Island; and then East, on this last-named mark, which will lead well clear of the Ferry Reef; and when the Tickle channel to the Westward of Birch Island becomes open, and bears to the Northward of N.E., steer towards it until the Southern extremity of Ouetique Island is seen over the beach of Birch Point, bearing E. ½ S. Run towards the last-named marks till Grande-digue Spit is passed, which will be when the West end of Birch Island bears due N.; then change the course instantly to S.S.E., or so as to make a direct course towards the middle of the Western entrance of Poulament Bay, and continue on that line until the North ends of Crow and Eagle Islands come in one; then East towards Ouetique Island until the Roman Catholic steeple at Discousse is in one with the N.E. point of Hawk Islet; and lastly, E.S.E., or so as to pass Hawk Islet at the distance of 100 or 150 fathoms. The vessel will then have arrived at the comparatively wide and open part of the passage off the Eastern entrance of Poulament Bay, hereafter to be described.

By following the directions just given, the vessel will have taken the ship-channel round to the Southward of Birch Shoal, which lies 130 fathoms S.W. by W. of Birch Point. Not less than 13 feet were found on that shoal; but as boulders may occasionally be dropped upon it by the ice, or a small point of rock might possibly, although not probably, have escaped discovery, it will be best to follow the example of the country vessels, and avoid running over it. To the Eastward of Hawk Island the passage becomes much wider, and is navigable for the largest ships; but as our main object is to guide vessels into a safe anchorage, we shall now reverse the order of description, and give it as the objects would appear in succession from East to West to a stranger running in from seaward. *Birch Shoal.*

THE EASTERN ENTRANCE OF LENNOX PASSAGE, between Cape Round and Mark Point, is 2¾ miles wide. The shoals off St. Peter's Bay occupy much of that space, but still leave a clear channel, a mile wide, between them and Cape Round. As this channel leads to the only anchorage which a stranger could venture to run for on the approach of bad weather in this very dangerous neighborhood, an accurate knowledge of it becomes of very considerable importance. *Eastern entrance.*

First, taking the dangers and objects on the North side of the channel.

HORSEHEADS SHOAL is rocky, irregular in shape, and of great extent, and the outermost danger off St. Peter's Bay. Besides several shallow patches, occasionally shown by breakers, there are 3 rocks near its Northern side which only just uncover in low tides, and on which the sea usually breaks heavily. These were formerly known by the name of the Three Stones. On the North point of this shoal, in 18 feet water, the Northern faces of Cascarette and Ouetique Islands are in one, bearing W. N.W. Its Western side will be cleared in 5 fathoms, if the *beach* of Beak Point be not opened out to the Eastward of Cape Round. The South side of the Horseheads is most in the way of vessels running in from the sea, and is just cleared by bringing the S.W. extremity of Ouetique Island and Savage Point in one, when Cascarette Island will appear just open to the S.W. of them, and bearing N.W. ¾ W. If Savage Point cannot be clearly made out, take care to keep Cascarette Island open 2 degrees at least to the S.W. of Ouetique, and to keep the lead going; remembering also that there can be no occasion to approach this dangerous shoal nearer than the depth of 10 fathoms, as the channel between it and Cape Round is a full mile wide, and from 5 to 19 fathoms deep. *Horseheads Shoal.*

With the aid of the chart, there will be little difficulty in distinguishing Ouetique and Cascarette Islands by a vessel entering this channel. They lie 4 or 5 miles to the N.W. of Cape Round, and will be seen towards the Breton Island shore. Ouetique, especially, is very remarkable, being small, precipitous, dark-looking, comparatively high, (about 50 feet,) and with a few pine-trees upon it; and Cascarette is the next island to the Westward of it, much larger, not so high, wooded, with low cliffs at its N.E., and a sandy point at its S.W. extremity.

Samson Rocks. THE SAMSON ROCKS lie half a mile North from the Horseheads, and nearer the mouth of St. Peter's Bay, bearing from Mark Point W.S.W. ½ W., nearly three-quarters of a mile. Two of these rocks dry at low-water, and have a considerable extent of shoal around them. The North points of Cascarette and Ouetique Islands in one, lead to the Northward of them, in 3½ fathoms. They may be safely approached by the lead, referring to the soundings in the chart.

Reserving St. Peter's Bay for the present, and crossing its mouth, we observe immediately to the Westward of it several remarkable cliffs of red clay; the Westernmost of them are on Bisset Island, which forms the East point of the narrow entrance to Bourgeoise Inlet, an extensive arm of the sea, with 12 feet at low-water in its mouth. The stores and wharfs at Mr. Bisset's establishment, and the Roman Catholic chapel on the East side, a short distance within the entrance, will point out this place to strangers. The fisheries, ship-building, and as yet limited agriculture, give employment to a number of people, principally Acadians, who are settled around the inlet.

Bourgeoise Inlet.

Ouetique Island. OUETIQUE ISLAND, already described, lies one mile to the S.W. of this inlet; the passage between them is full of dangers, amongst others, the Philip Rocks, which are almost always uncovered.

Philip Rocks.

Cascarette Island. Cascarette Island lies a long half mile to the Westward of Ouetique. The shallow water does not extend further than a cable's length from the South point of either of these islands, but there is a half-tide rock between them, from which shoal water extends 2 cables' length to the S.W.

Middle Rock. The proper passage here, is between Cascarette and Bernard Islands, and three-quarters of a mile wide; but in the middle lies a rocky bank, with 18 feet least water, which contracts the deep-water channel to the Southward of it to 200 fathoms in breadth.

Goillon Reef. THE GOILLON REEF lies half a mile further to the N.W., and about the same distance W.S.W. of Cascarette Island, leaving a clear channel into the extensive Inlet of Couteau, off the mouth of which it lies. This reef dries at half-tide. The marks for clearing it to the Southward, and likewise the 18-feet bank previously mentioned, is to keep Moulin Point open to the Southward of Birch Point, bearing W.N.W. ½ W.

Indian Creek. The common entrance to Indian Creek and to Couteau Inlet is seven-eighths of a mile wide between Cascarette Island and the East end of Birch Island. The inlet runs in 3 miles to the N.W., and is navigable for large vessels.

Couteau Inlet.

Birch Island. BIRCH ISLAND forms the North side of the main passage for the remaining distance of a mile, to Grande-digue, in which interval the only detached danger is Birch Shoal, off Birch Point.

Cape Round. Returning again to the Eastern entrance, we commence the review of its South side of the passage from Cape Round, a remarkable cliff of red clay, 60 feet high, and forming the North-east point of Madame Island. The shallow water, which here runs off only a quarter of a mile, widens as we proceed to the N.W., a long shingle beach of Goulet, and for a large vessel must be considered continuous to the N.E. extremity of Gabion Shoal, distant 2 miles, N.N.W., from Cape Round. The Gabion Shoal is rocky, and its least water is 5 feet, on the Morris Rock, near its N.W. angle. It is three-quarters of a mile in length, and so lies across the extremely intricate anchorage called the Goulet, that small craft only can pass between it and the Goulet Beach, from which it is distant three-quarters of a mile to the Northward.

Gabion Shoal.

The marks for clearing the Eastern end of this dangerous shoal, together with the shoal water off Goulet Beach, are the Roman Catholic chapel steeple at Bourgeoise Inlet and the Eastern point of Bisset Island in one, bearing N. by W. ½ W.; Cascarette and Ouetique Islands touching and bearing N.W. by W., clear its N. E. point; and lastly, Eagle and Bernard Islands touching, and bearing W. ¾ N., will lead clear along its North side, but must not be followed much beyond it because of the Discousse Shoal, which is separated from the Gabion Shoal by a channel only a quarter of a mile wide. This channel, which is 8 or 9 fathoms deep, leads towards the Goulet anchorage, which, as above-mentioned, lies to the Westward of Goulet Beach, and which is accessible to small vessels only through narrow channels between the shoals.

Discousse Shoal. DISCOUSSE SHOAL extends half a mile out to the Eastward of Bernard Island, and stretches across to Gabion Point, so as to form the bar of Discousse Harbor. It is rocky, with 3 feet least water, and the marks for clearing its North point, which is much in the way, are Poulament Islet and Bernard Island touching, and bearing West.

Discousse Harbor. DISCOUSSE HARBOR is formed by Bernard Island, the several parts of which, united by beaches, extend for nearly a mile along the shore of Madame Island. The entrance from the Eastward is by a very narrow channel, 7 feet deep at low-water, and passes close to the flag-staff, stores, and wharf, at the N.W. extremity of Gabion Point.

The steeple of the chapel, and the other buildings of the village on the shore opposite the island, will immediately point out this place to strangers. It is a secure and very pretty little harbor for the small vessels by which the fisheries are extensively prosecuted, and generally belonging to Jersey merchants residing at Arichat.

Poulament Bay.

POULAMENT BAY is a secure and capacious harbor, with three entrances formed by Eagle and Crow Islands, which lie nearly in a direct line from Bernard Island to Grande-digue, a distance of 2 miles to the Westward. Poulament Islet, small, low, round, and wooded, lies within Eagle Island, and, together with the shallows, divides the bay into two parts, of which the Eastern division leading to Poulament Creek, and containing most of the houses, and affording the most roomy anchorage, in 4 or 5 fathoms, with mud bottom, is the most frequented. An equal depth might be carried into the bay if the channel were buoyed, but the shoals extending in opposite directions from Bernard and Eagle Islands so overlap as almost to form a bar over which from 13 to 17 feet, according as it may be low or high water, are all that can be insured to a stranger, running in with the leading-marks astern; namely, Cascarette Island and Cordeau Point touching, and bearing N.E. ½ N. Vessels drawing too much water, or not wishing to run in, may safely anchor in the roadstead outside the bar, as will be presently directed

Tides.

It is high-water, on the full and change days, in the entrance of Poulament Bay, at 7h. 50m.: the rise in ordinary spring-tides is 6 feet, and in neap tides 4 feet. The tidal-streams are weak in the bay, and seldom exceed a knot in the channel off its mouth.

Hawk Islet.

HAWK ISLET, united at low-water to the East end of Eagle Island, and distant three-quarters of a mile W.N.W. from Bernard Island, forms the N.W. point of the Eastern entrance to Poulament Bay; it is bold to the Northward, but to the Eastward a shoal runs off towards Bernard Island to the distance of 2 cables' length. In the remaining distance of 1¼ mile, to Grande-digue, the principal dangers in the way are, the shoal which runs out, E. by N., from Crow Island a quarter of a mile, and which is cleared by bringing the North point of Hawk Islet and the steeple at Discousse in one; and secondly, the Birch Shoal, already described.

To the foregoing brief description, which should be read with reference to the Admiralty charts, the following directions are added for the use of vessels desirous of shelter on the approach of bad weather; and especially at the commencement of winds from between the South and East, as they seldom continue beyond a very few hours without bringing thick fog and rain. In a vessel so circumstanced, and approaching the Lennox Passage from the S.E., proceed as follows:—

Sheltered anchorages off Bernard Island;

Pass Cape Round at any distance between half and three-quarters of a mile, steering N.N.W. until Ouetique and Cascarette Islands touch; then change the course, and steer towards those islands, N.W. by W., or so as to keep them touching, until Poulament Islet appears just open to the Northward of Bernard Island; and then West, or towards the last-named marks, keeping the islet just open until the chapel at Bourgeoise Islet comes in one with the Eastern point of Ouetique Island, bearing N. E. The vessel will now be in about 9 fathoms, with mud bottom; and if she bring up with the last-mentioned marks on, will be distant a long cable's length from the shallow water off the North side of Bernard Island, and in safe anchorage, being sheltered from S.E. winds by Discousse and Gabion Shoals, and by land in every other direction.

off Poulament;

If the anchorage off the Eastern entrance of Poulament be preferred, then, instead of anchoring when the steeple at Bourgeoise Islet and the Eastern point of Ouetique Island come in one, change the course to W.N.W., or, as may be found necessary, to open out the North point of Crow Island a little to the Northward of Hawk Islet. Having done so, run towards them, W. by N., until the steeple at Discousse comes in one with the *high-water* Western extremity of Bernard Island, when the vessel will have arrived within 100 or 150 fathoms of her intended anchorage. Continue the W. by N. course until Poulament Islet and Eagle Island close, and when they touch, bearing W. by S., Cordeau Point will either be touching, or only just shut in behind the Western end of Cascarette Island, bearing N.E. ½ N. Round to, to the Southward, with these last-named marks on, and bring up either in 7 fathoms, with the Northern extremities of Crow and Hawk Islands in one; or a little further in, with the two points on the North side of Bernard Island in one; there the depth will be 6 fathoms, and the bottom in both places mud. If the vessel does not draw more than 13 feet water she may safely run into Poulament Bay by keeping the leading-marks on astern as she runs from them, (namely, Cordeau Point and Cascarette Island touching, or very slightly open, and bearing N.E. ½ N.), and when the South side of Crow Island appears in sight to the Southward of Eagle Island, she will be within the bar, and may bring up in 4½ fathoms, mud, and in a perfectly secure harbor.

in Poulament Bay.

With an accurate chart on a sufficient scale, and off Grande-digue, and in competent hands, there would be little difficulty in taking a large vessel to the anchorage at

Grande-digue; but written directions would avail but little in such a narrow and difficult channel, where there are neither buoys nor beacons, and where the least mistake in making out the objects named as leading-marks would almost instantly run her on shore.

St. Peter's Bay. ST. PETER'S BAY,* which is 2 miles wide, opens immediately to the Northward of the Samson Rocks and of Horseheads Shoals, and may be approached either East or West of those dangers. It has excellent anchorage for any class of vessels, especially at Grande-grève on its Eastern shore; but it is rendered almost inaccessible by the numerous rocky shoals scattered over the bay, and which could scarcely be avoided in a large ship without the assistance of buoys. Vessels not exceeding 10 or 12 feet draught may run in without difficulty, with the aid of the chart, on which they must rely, for no directions would avail in so intricate a place.

The principal settlements are at Grande-grève and along the South side of Jerome Point, a high headland projecting from the North-east side of the bay and rising to the summit of Mount Granville, on which the remains of an old fort may be seen, 190 feet above the sea. Vessels usually anchor in the N.E. corner of the bay, within Jerome Point, where there are the remains of another old fort, and a wharf at the *Haul-over*, across to the Bras Dor Lake.

Haul-over. On the North side of the Haul-over there is a wharf at the ship-building establishment of Mr. Handley, and there is also a post-office.

A canal has been more than once proposed at this place, and will probably be formed at no very distant day. A survey has recently been made for it by Mr. Wm. Fairbanks, an intelligent civil engineer of Nova Scotia. The distance across the neck of land is 2400 feet; its greatest height, extending only for a small part of the distance, 45 feet; and the cutting easy. The advantages of such a canal to the numerous vessels engaged in the coal trade to and from the Sydney mines would be very great, as they would thus be enabled to substitute for the long and comparatively dangerous circuit by Scatari, a short and safe route through the Bras Dor. Scarcely less would be the benefit it would confer upon the settlers along the shores of the Bras Dor, by opening for them a way to markets for agricultural produce at Arichat, Canso, and other places where the fisheries are almost exclusively prosecuted.

Tides. It is high-water, on the full and change days, in St. Peter's Bay, at 7½ hours, the rise being 6 feet in spring, and 4 feet in neap tides.

The main level of the Bras Dor, at the Haul-over, was found to be rather more than 2 feet below the high-water of ordinary spring-tides in the bay of St. Peter, but the influence of the tides is imperceptible in that part of the former, though winds cause a fluctuation of level to the amount of about 2 feet.

CHEDABUCTO BAY.

Chedabucto Bay, North Coast. CHEDABUCTO BAY, through which all vessels entering or leaving the Gulf of St. Lawrence by the Gut of Canso must pass, is 17½ miles wide at the entrance, from Michaux Point to Cranberry Island light-house; but the entrance is generally considered to lie between Green Island and the Canso Ledges, in which case the breadth is only 7½ miles. The whole depth of the bay, from the Easternmost of the Canso Ledges to Guysborough, is 26 miles. The following description of its shores, with the dangers, anchorages, and harbors, on either side, is given from East to West, or as they would be passed by a vessel running in from sea:—

Michaux Point. MICHAUX POINT, the N.E. point of the bay, (in some charts Cape Hinchinbroke, in others Peninsula Point, names unknown to the inhabitants,) is a peninsula, united to the main-land by a double beach, inclosing a pond; and Red Point and Red Islet are distant from it 2¼ miles to the W.N.W. Off these points, and extending across the bay between them, lie the Michaux Ledges, dry at low-water, and usually shown by heavy breakers. Lying nearly a mile from the shore, with deep water close to them, they are extremely dangerous in dark nights or foggy weather. The S.W. extremities of St. Peter's Island and Mark Point in one, lead close outside of them, in 4 fathoms; therefore, in standing towards them, tack while the point is well open to the West of the island.

St. Peter's Island. ST. PETER'S ISLAND lies 3½ miles further to the N.W.; and in the shoal bay between it and Red Point will be seen the Roman Catholic church steeple and the village of Ardoise. The island is low, and about three-quarters of a mile long.

The cove, on its inner or north side, affords shelter to numerous small craft and boats; this being one of the principal fishing-stations in these parts. The island is bold to seaward, but off its N.W. side is Haddock Rock, at a distance of a quarter of a mile; and in the bay between it and Mark Point there is much shoal water, leaving,

* Formerly Port Toulouse.

however, a clear channel within the Horseheads and Samson Rocks into St. Peter's Bay. The distance across the Eastern entrance of the Lennox Passage, from St. Peter's Island to Cape Round, is 3¾ miles W. ½ N.

Madame Island. All objects of importance on the North side of Madame Island having been noticed, we have now to review the Eastern and Southern shores, commencing at Beak Point, distant 1¾ mile S.W. by S. from Cape Round. The shoal water runs out from Beak Point only to the distance of 2 cables' length, but off it there is much rocky and irregular ground, on which the sea is said to break occasionally in very heavy gales. The least water we could find there was 4 fathoms, which bears from the point S.E., and is distant 1½ mile. Another rocky patch, with 4½ fathoms, lies E. by S., a mile from the point. A large ship should pass outside this rocky ground, especially when there is a heavy sea running.

Bay of Rocks. THE BAY OF ROCKS, lying between Beak Point and the Grosnez, a rocky islet at the N.E. extremity of Petitdegrat Island, is 3 miles wide, and deep. It is a dangerous place, affording no safe anchorage for ships, being open to all Easterly winds, which send in a heavy sea. *Bewes Shoal* Bewes Shoal, with 21 feet least water, lies nearly in the middle of the bay, and besides the low rocky islets near its head, there are many other rocks around and off its shores.

Red Head. RED HEAD, the S.E. extremity of Petitdegrat Island, is a remarkable cliff, 70 feet high, and 2 miles S.W. from Grosnez. Shallow water runs out from it a quarter of a mile, to clear which, keep Beak Point open to the Eastward of Flat Point.

Green Island. GREEN ISLAND, of slate, with precipitous shores, 90 feet high, and a third of a mile long, lies off Red Head, a mile to the S.E. It is bold all round, and there is a clear channel three-quarters of a mile wide between it and Red Head.

Orpheus Rock. ORPHEUS ROCK (called Boss by the fishermen), is 1¾ mile E.S.E. from Green Island. It is awash at low-water, and the sea consequently almost always breaks on it; otherwise it would be still more dangerous than it is. It is small, with deep water all round, at the distance of a cable's length to the S.W. there being 50 fathoms. Heath Head (the Southern extremity of Petitdegrat Island, and distant a mile West from Red Head) will lead clear of this rock, either to the Northward or Southward, according as it may be kept open to the North or to the South of Green Island.

Petitdegrat Inlet. PETITDEGRAT INLET, separated from Madame Island by a very narrow channel, through which boats may pass at high-water into the Bay of Rocks, is 3 miles long, and has water enough for large vessels; but the rocks are so numerous, and the channel between them so narrow, as to render the aid of a native pilot indispensable. *Fisheries.* The fisheries are extensively prosecuted from this inlet; and its shores, as well as almost every cove in the island, are occupied by the fishermen and their employers.

Cape Hogan. CAPE HOGAN, the Southern promontory of Madame Island, separates Petitdegrat from Arichat, and is a bold and remarkable headland, with cliffs 100 feet high.

Arichat Harbor; Eastern Entrance. ARICHAT HARBOR is sheltered by Jerseyman Island, which stretches across the Bay. It is a spacious and secure harbor, capable of containing any number of the largest ships. It has two entrances, of which the Western is the least difficult for strangers, although only a cable's length wide. The Eastern entrance is 3 cables' length wide, but it lies between shoals, which, with the other dangers and the marks for clearing them, must first be briefly described; referring as usual to the Admiralty chart for the objects named.

Hautfond Shoals. THE HAUTFOND SHOALS are a chain of rocky patches, now for the first time correctly shown in any chart. The least water, 10 feet, is on the outermost patch, and bears from Moyac Point, N.W. by W., from Marache Point, W.S.W. ½ W., and is nearly a mile from each of them. The other patches lie in a line from the outer one to the North side of Forest Cove; the least water on them is 21 feet, and there is deep water between them; but the safe channel for ships is outside, or to the Westward of them all. Cape Hogan and Green Island in one, lead past these shoals at the distance of a third of a mile to the Southward; and Hubert's White House and Flagstaff seen over the Eastern extremity of the *cliffs* of Jerseyman Island, bearing N.E., will just clear them to the N.W.

Marache Point. MARACHE POINT is quite bold to the Westward, with the exception of two small rocky patches which lie off it at the respective distances of 300 and 400 fathoms to the N.W., and on which the least water is 4 fathoms. To the Northward of the point, and for some distance to the Eastward, the shoal water extends 150 fathoms off shore.

Arichat Beacon. ARICHAT BEACON.—A beacon light on Point Marache, on the East side of the Southern entrance to Arichat Harbor. The building is square, painted white, and shows a white light, 34 feet above sea-level—rise and fall 6 feet. The point is bold to, and the following are the bearings of the principal head-lights:—

Light.

From the Light to Cranberry Island Light over Winging Point, S. 3° E.
" " to Winging Point, S. 5 W.
" " to Ragged Head, North Shore, Chedabucto Bay, N. 79 W.
" " to Madame Island, East side of entrance to Strait of Canso in one with Jerry Island Reef, N. 48 W.
" Little Arichat Head, N. 40 W.

Capodiette Bay.

CAPODIETTE BAY, 1½ mile wide, between Marache and Kavanagh Points, although open to Westerly winds, and to the heavy swell rolling in at times round the point from the Southward, nevertheless affords a tolerably good occasional anchorage in 10 or 12 fathoms, and mud bottom: the best ground being in the deepest water.

Fiddle Shoal.

FIDDLE SHOAL has 10 feet least water at the outer end of the rocky bank which extends from Kavanagh Point, 300 fathoms to the W.N.W. There is no passage for large vessels between it and the point, which has several dry rocks off it, and shoal water all along its S.W. side, to the distance of 150 fathoms off shore. On the North side of the Point within the harbor, a reef, with only 3 feet at low-water, runs off a quarter of a mile, which is half-way across to the wharves of the town of Arichat. This danger must be carefully avoided when hauling to the Eastward towards the head of the harbor.

Henley Ledges.

On the opposite side of this Eastern entrance lie the Henley Ledges, forming the S.W. extremity of the rocky bank off Jerseyman Island, and a mile from Marache Point, from which they bear N.W. by W., though the breadth of the deep water between them is three-quarters of a mile. They are black rocks, covered only at high-water, and almost always shown by breakers. To seaward, the shallow water extends from them only 150 fathoms, but there is a rock awash a third of a mile from them to the N.N.W. ½ W., and two others between them and Jerseyman Island, thus leaving no passage for ships. There are no good leading-marks for passing to the S.W. of these rocks; but vessels will pass well to the S.E. of them, if the English church steeple at Arichat be not shut in behind the Eastern extremity of Jerseyman Island.

Pilot Rock.

PILOT ROCK is on the N.W. side of the channel, and at the extremity of the shallow water off the East end of Jerseyman Island, from which it is distant 300 fathoms to the S.E. It is small, with 4 feet least water, and quite bold to the Southward. There is no channel between it and the island for large vessels. The leading-mark to clear it to the S.E. is De Carteret's Flagstaff, near to the East end of Arichat, seen over Kavanagh Point; but this mark leads very close to the rock.

Poule Reef and Islet.

POULE REEF, with 7 feet least water, lies 200 fathoms E. by N. from Poule Islet, which is nearly united to the East end of Jerseyman Island at low-water. There is a narrow channel, fit only for small craft, between the shoal and the islet; but the ship-channel to the Eastward of this shoal, between it and the Fiddle, is 300 fathoms wide, from 3 fathoms to 3 fathoms on either side, with depth sufficient for the largest ships.

Directions.

If bound to Arichat, with a leading wind, that is, any wind from S.S.E. round by South, and W. to W.N.W., proceed as follows:—If the approach be from the Westward, avoid the Cerberus Rock by attending to the marks which will be presently given: if from the Eastward, pass the Hautfond Shoals by keeping some part of Green Island in sight to the Southward of Cape Hogan, until Arichat church appears only a little open to the Eastward of Jerseyman Island, bearing N.E. by E. ¼ E. Having brought the church steeple on that line of bearing, steer for it, but keeping it a little open, until the beacon on Marache Point bears S.E. by E., or until the Henley Ledges are in one with Arichat Head, the Western extremity of Creighton Island bearing N.W. by N., and are distant a quarter of a mile. Then change the course to E. ¼ N., or so as to make a direct course towards Little Barachois at the head of Capodiette Bay; and as soon as the Roman Catholic church steeple opens a little to the Eastward of the Priest's Flagstaff, bearing N., run towards it until the Southern extremity of Creighton Island is seen through the Crid Pass. The vessel being then within Poule Reef, may safely haul to the Westward, and select her berth at pleasure, in the most roomy part of the harbor, anywhere to the North of the line from Poule Islet to Beach Point. South of that line, the Eastern bight of Jerseyman Island contains Cage Shoal, with only 7 feet water, and much foul ground.

If the vessel should have occasion to go to the Eastern part of the harbor, she should stand well over to the North shore before bearing up to the Eastward, and run along it at the distance of a cable's length from the ends of the wharves, until after Marache Point has disappeared behind Kavanagh Point, when she will be to the Eastward of the reef, off the last-named point, and will find bold shores and plenty of water to within 120 fathoms of the entrance of the cove at the head of the harbor.

The foregoing are safe and simple directions for a stranger in a large vessel, but

with an Easterly wind it would not be desirable to run so far to leeward as would be required to bring the English church steeple in one with the Eastern extremity of Jerseyman Island; and for persons sufficiently acquainted with the place to be certain of distinguishing the leading-marks, it would not be necessary. They could pass either outside of the Hautfond Shoals, upon the leading-marks given for clearing them to the N.W., namely, Hubert's house and flagstaff shut in behind the Eastern extremity of the cliffs of Jerseyman Island; or inside of them, by steering for the Roman Catholic steeple and Marache Point exactly in one, bearing N.N.E. ¼ E., until within a quarter of a mile of the point; then, after keeping away a little to pass the point and the shoal water mentioned off its North side, they will have to beat up Capodiette Bay until the marks for running in, namely, the Roman Catholic church open a little to the Eastward of the Priest's Flagstaff bearing North, come on.

Western entrance to Arichat.

In approaching Arichat from the Westward, the only out-lying danger, besides the Cerberus Rock, is Creighton Shoal; and this last will be avoided if, after passing the Peninsula Shoals, Bear Head be not shut in behind Peninsula Point until the Roman Catholic church at Arichat is seen to the Southward of the Crid Islands; a mark which also leads clear of Picard Reef, and of all the shoal-water off Creighton Island.

Crid Islands.

The Crid Islands, which are small and rocky, form the North side of Crid Pass, the whole breadth of which across to Beach Point is 160 fathoms; but there are half-tide rocks off both ends of those little islands, which reduce the navigable breadth of the channel to 100 fathoms. The extremity of Beach Point, which is all shingle, may be safely passed as near as 30 fathoms; but on the outside of the point the shoal water commences immediately, and continues increasing in breadth from the shore to the Western extremity of the island, where it extends a third of a mile out from the cliffs to the N.W. and W.; and still further to the S.W. and S.; in which last direction it unites with the Henley Ledges.

Crid Pass.

With the necessary leading wind, that is, any wind from South round by West, and N. to N.N.E., proceed as follows:—Having cleared Creighton Shoal, as already directed, bring the Roman Catholic steeple to appear through the middle of the Pass, or a little to the Northward of Beach Point, when it will bear E. ½ S. Keep it so while running towards it, and when the vessel has arrived within half a mile of the point, if Robin wharf and stores (on the South side of the harbor) be not already seen to the Northward of Beach Point, sheer a little to the Northward till they are so, and then steer for them E.S.E. ½ E., or so as to pass the point at any distance between 30 and 100 fathoms, into the harbor, where a berth may be selected as already directed.

Tides at Arichat.

It is high-water at Arichat, on the full and change days, at 8h. 10m. after the moon's transit; and the ordinary rise is from 4 to 5 feet; but extraordinary spring-tides may rise 6 feet. The stream of flood comes in by the Eastern entrance, running through the harbor to the Westward, and the ebb-stream to the contrary; but these streams are not very regular, and seldom exceed the rate of one knot.

Arichat Town.

The straggling but well-placed town of Arichat extends nearly 3 miles along the bold and steep North shore of the harbor, where there are many wharfs and stores. Of the two churches, the Roman Catholic is the largest and the Westernmost; and the only other public building at all remarkable is the court-house, standing more to the Eastward, and distinguished by its cupola.

Fisheries. Population.

Arichat is the head-quarters of the fisheries in its neighborhood, and the most important seaport, both in commerce and in population, on the Atlantic coast of Nova Scotia Eastward of Halifax.

Water.

The usual watering-place is at a spring near Hubert's wharf, where good water may be obtained on payment of a small sum. Water may also be obtained at Irish Point, from the outlet of the chain of small lakes in rear of the town.

Cerberus Rock.

THE CERBERUS ROCK, just awash at low-water, with deep water all round, and lying directly in the way of vessels to and from the Gut of Canso, is exceedingly dangerous in dark nights and foggy weather. In the day-time either breakers or a rippling over it can almost always be seen. It bears from Arichat Head, the nearest land, S.S.W., 2½ miles; and is rather more distant from Jerseyman Island, on a W.S.W. line of bearing. The clearing-marks are as follows:—Cape Hogan and Green Island in one, bearing E.S.E. ¾ E., will lead clear to the Southward of the Cerberus at the distance of 400 fathoms. The English church steeple at Arichat and the Eastern extremity of the *Western* peninsula of Jerseyman Island in one, bearing E.N.E. ½ E., will lead a cable's length to the S.E. of it. Carleton Head, open to the Westward of Wasting Islet; or Eddy Point and Ship Point in one, will, either of them, lead clear to the Westward of this rock at the distance of a mile; but those objects are too distant to be often clearly distinguished, therefore, to avoid this danger in a vessel bound to the Westward, keep some part of Green Island in sight to the Southward of Cape Hogan until the English church at Arichat is seen over the shingle isthmus uniting the two peninsulas of Jerseyman Island, or until Arichat Head bears N.E. by N.; then the course may be safely shaped direct for the Gut of Canso. In a vessel outward

bound, take care that the course made good from the middle of the Southern entrance of the Gut of Canso is not more to the Eastward than S.S.E. until Green Island appears to the Southward of Cape Hogan; or until the English steeple at Arichat is seen over the Jerseyman isthmus, when the course may be safely shaped more to the Eastward and out to sea.

Little Arichat. LITTLE ARICHAT is a small and secure harbor, where the fisheries are extensively prosecuted: it lies inside of Creighton Island, and 2 miles N.W. from Arichat. The approach is from the Westward, and over a bar, with 17 feet at low-water, which extends across to the Northward from Arichat Head, the West extremity of Creighton Island. The entrance of the harbor, half a mile within this bar, is 150 fathoms wide between Creighton and Bosdet Points; the former being a long spit of sand and shingle, with stores and a wharf, on the North side of Creighton Island. The vessels lie immediately within the entrance in 3½ fathoms, and as securely as in a dock, the harbor being closed at the East end by a bar of shingle, which dries at low-water. A stranger might require the aid of a pilot, but the chart, with the following brief directions, would enable any intelligent seaman to take a ship into this small but very pretty harbor:

Bring the wharf on the North side of Bosdet Point to bear between E. by S. and E. ½ S., and steer for it, the vessel will then pass the bar in not less than 15 feet at low-water. Continue the same course until the shingly S.W. extremity of Bosdet Point and the N.E. extremity of Creighton Island (at the East end of the harbor) are touching, and bearing S.E. ½ S., when change the course, and keep the last-named marks in one exactly, running towards them until Bosdet Point is distant only 150 fathoms ahead, and the shingly S.E. extremity of Creighton Point bears S.W. by S., and is distant 100 fathoms; then change the course to the Southward, so as to be two-thirds of the distance over from Creighton Point towards Bosdet Point, as you pass between them into the harbor.

Leblanc Harbor. LEBLANC HARBOR has its entrance half a mile from Little Arichat, and in the North-east corner of the same bay. Six feet at low-water can be carried in through its very narrow entrance, and there is much more within. It is an extensive place, containing a population of fishermen and small farmers. At the N.W. extremity of this harbor is the Mousselier Pass, very narrow, between muscle-beds, and only one foot deep at low-water. Boats pass through it into Haddock Harbor, the principal entrance to which is by the Lennox Passage, by a very narrow channel, to the Eastward of Campbell Island, but 20 feet deep at low-water. Both these last-named harbors are occasionally resorted to by small vessels in the fishing season, but they are of no use to large ships.

Mousselier Pass.

Creighton Shoal. CREIGHTON SHOAL is the only danger outside of the line joining Arichat Head and Peninsula Point, if we except the Peninsula Shoal. It is rocky, and the least water, 11 feet, lies with the Roman Catholic church at Arichat just shut in behind the Southern extremity of Creighton Island; it bears West three-quarters of a mile from Arichat Head. The marks for passing to the Northward of it will be useful to vessels bound to and from Little Arichat, and are, Bosdet Point and wharf just open to the Northward of Creighton Island, and bearing E. ¼ N. Bear Head and Peninsula Point in one, bearing N.W., lead past it at the distance of a third of a mile to the S.W.; and the Roman Catholic church at Arichat open to the Southward of the Crid Islands, bearing E. ¾ S., not only leads a quarter of a mile to the Southward of Creighton Shoal, but also clears Picard Reef, which extends from the S. point of Creighton Island 200 fathoms to the Westward.

Janvrin Harbor. In the bay between Arichat Head and Peninsula Point, which is 3½ miles across, in a N.W. by W. ½ W. direction, are Deep Cove and Janvrin Harbor, barred by Dorey Ledge, and only useful to small craft and boats. In the entrance of Janvrin Harbor, and 1½ mile Eastward from Peninsula Point, lies Delorier Island, from which extends the rocky Bentinck Shoals 700 fathoms out to the S.W. The least water on these shoals is 4 feet, but as they lie in a bay, they are not much in the way of vessels. They join the Peninsula Shoals to the Westward.

Cape Argos. In order to complete the description of the North side of Chedabucto Bay, we must now cross the Gut of Canso to Cape Argos, and proceed thence to the Westward. From Cape Argos to Guysborough, at the head of the bay, a distance of 12 miles, the prevailing features are peninsulated points of drift sand, clay, and boulders, resting on sandstone, and presenting low cliffs to the sea. These are united to the main-land by beaches of shingle, inclosing large ponds, several of which admit boats at high-water when the surf is not too heavy. In the rear of these ponds are the houses of a scattered population, subsisting by fishing and farming, and situated on the Southern slope of ridges rising to the height of 200 feet above the sea.

Murdock Ledge. Proceeding from Cape Argos, 2 miles S.W. by W. brings us to Oyster Point, whence Grady Point bears W. by S., 1¾ mile. Midway between the two last-named points lies Murdock Ledge, dry at low-water, and half a mile off shore. Hydra Rock, one

Hydra Rock.

of the greatest dangers in the bay, lies directly off Grady Point, from which it bears S.S.E. ½ E., and distant 1½ mile. It carries 12 feet least water. The part of the shelf on which there is less than 3 fathoms, is only a cable's length in diameter, but there is less than 5 fathoms over a much larger space. There are 8 or 9 fathoms between it and the land, and 11 or 12 fathoms outside of it at the distance of a quarter of a mile.

During the heavy swell from the Eastward, so frequent in this bay, its position is shown by heavy breakers; at other times it is exceedingly dangerous, especially to vessels approaching it from the S.W., as on that side there are no good leading-marks. The mark for passing a quarter of a mile to the S.E. of it, is Cape Argos and Thomas Head touching, and bearing N.E. ½ N.

Ragged Head.

RAGGED HEAD, 4 miles W. ¼ S. from Grady Point, is a rocky peninsula, forming the apex of a triangle, whose sides are long shingle beaches, inclosing a large pond 5 or 6 fathoms deep, but which boats can enter only at high-water by a narrow outlet on its Western side. This remarkable headland, which appears like an island when seen from a distance, forms the Eastern point of Moose Bay, which is 2¼ miles across to Moose Point, in a W. by N. direction, and three-quarters of a mile deep. In shape, this bay is a semicircle, with shingle beach, unbroken, excepting by the shallow outlets of ponds. It affords anchorage in from 5 to 7 fathoms, sand and mud bottom: but it can be considered safe only in fine summer weather, on account of the heavy swell which accompanies Easterly gales at other seasons. The only danger to be avoided is the flat of sand which extends nearly half a mile off the Eastern side of the bay. In the remaining distance of 2½ miles, from Moose Point to Guysborough, all that requires particular notice is a rocky bank, extending half a mile out from the shore midway between them, and on which there are 19 feet at low-water.

Moose Bay.

South Coast of Chedabucto Bay.

From Cape Canso to Guysborough, a distance of 25 miles, the South coast of this great bay is composed of primary rocks, partially covered with drift sand, clay, and boulders.

Canso Harbor.

The harbor is formed by Piscataqua and George Islands on the East, and by the mainl-and and Durell Island on the West. Cutler Island, together with the shallow water between it and Durell Island, shelter it from the North; while Grave Island and the bar uniting it to Lanigan Beach, protect it from the S.E. Grave Island is very small, with steep clay banks fast wasting away by the action of the sea. The entrance to the harbor is between the latter and Cutler Island, towards the wharves of the town, off which the anchorage is perfectly secure, with water for the largest ships; but the ship-channel, which runs through into Chedabucto Bay, passes to the Eastward of those islands, between them and Piscataqua. The least water in this channel, 4 fathoms, is on a bar which stretches across from Grave Island to Piscataqua Island.

Canso Town.

The town of Canso is on the main-land, the more ancient part standing on hills of red sand, clay, and large boulders. The Roman Catholic church, built on the summit of a ridge 100 feet high, is a conspicuous object, seen over the islands from a great distance at sea. The newer part of the town, together with the Baptist and Wesleyan chapels, are further Westward, along the shore of "The Tickle," a narrow boat-channel, separating Durell Island from the main-land. The whole forms a long straggling village, with a population of about 600 souls. Near the North point of Durell Island, which is 1½ mile long, is Flagg Hill, 105 feet high, and mentioned hereafter as an important leading-mark.

Tickle Channel.

The following description of the objects and dangers on either side of the ship-channel, in the order in which they would be passed by a vessel running in from sea, will sufficiently elucidate the Admiralty chart, without which, or the aid of an experienced fisherman of the place, to whom the appearance of every rock and breaker is familiar, no one should attempt a navigation so hazardous.

Canso Ship-Channel.

Approaching from the Southward, the entrance of the ship-channel between Cape Canso and Cranberry Island is a mile wide.

Cape Canso.

CAPE CANSO is a low islet, nearly joined to the East point of Andrew Island: and the Cape Rock, small, and 8 feet high, will be seen off it, 120 fathoms to the S. E. by S. Crossing the entrance of Glasgow Harbor, a distance of 1¼ mile to N. W., we arrive at Glasgow Head, a remarkable red clay cliff 50 feet high. An equal distance further in the same direction, along an unbroken shore, brings us to the town and harbor of Canso.

The Patch.

The outermost danger on this side is the Patch, a rock, on which we found no less than 30 feet water, but on which the sea is said to break occasionally: it bears from Cape Canso S.S.E. ½ E., 1¾ mile.

Boom Rock.

Next to the Patch comes the Boom Rock, with 12 feet least water, bearing South, 1½ mile from Cape Canso; and E.S.E., 1½ mile from the South point of Andrew Island. It has obtained a melancholy celebrity, by the loss of a schooner on it, with all hands, while this survey was in progress.

Cape Breaker. The CAPE BREAKER, with 16 feet least water, bears from Cape Canso S.E. by E., 1 mile; and is cleared to the Eastward by Crow and Cranberry Islands touching, on a N. by W. bearing. As it can be seen only when there is a heavy sea, this rock is extremely dangerous, and would be still more so were it not that the Roaring Bull, 400 fathoms to the Westward, almost always shows, and therefore points out the position of its treacherous neighbor.

Roaring Bull. THE ROARING BULL has 2 feet least water, and bears from Cape Canso S.E. ½ S., two-thirds of a mile.

Keeper and Kirby Rocks. KEEPER and KIRBY ROCKS, with 24 and 15 feet least water, are distant half a mile and one mile, respectively, N.W. by N. from the Cape Breaker; and Kirby Rock bears from Cape Canso E.N.E., 300 fathoms. The Roman Catholic steeple at Canso, open to the N.E. of Glasgow Head bearing N.W. ½ N., leads just clear to the N.E. the Cape Breaker, and of the other dangers above mentioned.

Black Rocks. THE BLACK ROCKS lie half a mile N.N.W. from Kirby Rock, the passage into Glasgow Harbor being between them. They are two masses of trap rock about 5 feet high above spring tides; they can therefore always be seen, and as the shoal water extends from them only a cable's length to the Eastward, they are of great use in pointing out the Western side of the channel.

Bootes and Man-of-war Rocks. The BOOTES with 6 feet least water, and the Man-of-war Rock, which covers at half tide, lie further N. by W.; the latter, the most distant, being a long half mile from the Black Rocks. There is no safe channel for ships between these three last-named dangers, which all stand on a shoal and rocky bank, that stretches across the entrance of Glasgow Harbor; but there is a navigable channel between them and Glasgow Head, though narrow and difficult.

Man-of-war Rock. MAN-OF-WAR ROCK bears from Glasgow Head E.N.E., about half a mile. It lies much in the way, but is usually shown by breakers, and the marks for it are distinct and good. The Eastern ends of the Black Rocks and of the Cape Rock when in one, bearing S. ½ E., lead just to the Eastward of it, and, of course, clear the Bootes; therefore let the Cape Rock be kept open to the Eastward of the Black Rocks until Man-of-war Rock is past; which will be the case when Flag Hill comes in one with the steep bank (not the beach) of Fort Point, bearing N.W. The last-named marks lead just clear to the N.E. of this dangerous rock.

Mackerel Rock. The MACKEREL ROCK lies half a mile further to the N.W. Having 10 feet least water, it seldom shows, and is therefore the more dangerous. When on it, the Eastern extremities of Oliver Island and of Derabie East Rock are in one, and just open to the Eastward of Petit-pas, which bears from it N.E., 400 fathoms. The same marks that clear Man-of-war Rock, namely, Flag Hill and the *steep bank* of Fort Point, as above mentioned, lead to the N.E. of this rock also, at the distance of half a cable's length. There is a clear channel on either side of the Mackerel Rock, but that to the North-eastward of it has the advantage of leading-marks.

South Shoal. SOUTH SHOAL is the last danger on the West side of the channel, until we arrive at Grave Island, and the entrance of Canso Harbor. It has 7 feet least water, and extends 300 fathoms off shore, or half-way across towards the Eastern extremity of Grassy Island, leaving a clear channel between it and Grass Reef, of 180 fathoms in breadth.

The shoal water extends only 50 fathoms off Grave Island, leaving a channel between it and Piscataqua Island 100 fathoms wide, and 4 fathoms deep at low-water.

Cranberry Island. Cranberry Lights. CRANBERRY ISLAND, with its most useful lights, marks the East side of the entrance of the channel, as already mentioned. The island is low, rocky, and a quarter of a mile long. The light-house stands near its Northern end, and is of wood, octagonal in shape, painted red and white horizontally, and displays two lights vertically. The upper light, 75 feet above high-water, can be seen from a distance of 15 miles; the lower, only from a distance of 9 miles. They bear from Cape Canso N.E. by N., 1¼ mile; but dangers on either side reduce the breadth of the clear channel to half a mile.

Frying-pan and Crow Islets. THE FRYING-PAN, a low islet of shingle, a quarter of a mile N. by W. from the light-house; and Crow Islet, a low rock, covered with dark spruce bushes, not exceeding 20 feet in height, and distant three-quarters of a mile further in the same direction, will easily be distinguished. Still more remarkable is Petit-pas, a small, round, grassy islet, a cable's length in diameter, with a red clay-cliff 50 feet high, and 1¼ mile N.W. ¼ N. from the light-house.

Oliver Island. OLIVER ISLAND, wooded, and separated from the East end of George Island by a narrow boat-channel, must also be noticed. Its Eastern extremity, Lock Point, forms a leading-mark, and bears from Petit-pas N.E. ½ E., a quarter of a mile.

Grassy Island. GRASSY ISLAND, a third of a mile to the westward of Petit-pas, is a hill of drift-sand, clay, and boulders, half a mile long, and 66 feet high. It is covered with grass, and displays the only other clay-cliff besides that of Petit-pas on this side of the channel. It is no longer insulated, being now united to George Island by a bar of shingle, which is never covered. The remains of an extensive redoubt give the name of Fort

Point to the high Western extremity of the steep, grassy bank of this island, which, as it is used for a leading-mark, must be carefully distinguished from the edge of the shingle beach, extending from it 100 fathoms to the N.W., and also used for a leading-mark. There is a narrow channel for boats between the Grassy Island beach and Piscataqua Island; which last forms the Eastern side of the channel for the remaining distance to Canso Harbor.

Stanley Shoals.

Confining our attention at present to the dangers bordering on the ship-channel, we have first to notice Stanley Shoals—three small rocky patches a quarter of a mile apart. The least water on them, 4 fathoms, is sometimes shown by a breaker, and lies with Flag Hill and Fort Point in one, and with Cranberry light-house, bearing N.N.W. ¾ W., 1½ mile. The Eastern extremities of Crow and Cranberry Islands in one, bearing N. by W. ½ W., lead clear to the Westward of this shoal at the distance of a cable's length. From Nickerson Rock, with 4 fathoms least water, the light-house bears N.W. ½ W., 1¼ mile, and lying half a mile N.N.E. ½ E. from Stanley Shoals, it is less in the way than them. The same remark applies to David Rock, with 13 feet least water, it being half a mile nearer to the light-house, which bears from it N.W. ¼ N., three-quarters of a mile.

Nickerson & David Rocks.

Washball Shoal.

THE WASHBALL, a rocky patch, dry at low-water, lies 200 fathoms W.S.W. from David Rock, and 700 fathoms from the light-house, which bears N.N.W. ¾ W.: it is, therefore, half-way out from the light-house towards the Stanley Shoals, and, as it can almost always be seen, is of great use in guiding vessels. These two last-named rocks lie so near the edge of the Cranberry Island bank as to leave no safe passage between them.

Pink Rock.

THE PINK, a rock with 4 feet least water, lies half a mile to the Southward of the light-house; but an arm from it with 18 feet water extends 150 fathoms W. by N. From this rocky arm, which forms the extreme Southern edge of the Cranberry Island bank, the light-house bears N.N.E. half a mile. Flag Hill and the S.W. extremity of *the beach* of Fort Point in one, and bearing N.W. ¼ N., lead just clear to the Southward of this danger; but the beach cannot always be made out, in which case, Flag Hill should be kept 4 or 5 degrees open to the S.W. of Fort Point, until the bearing of the light-house shows that the rock is passed. The shallow water, less than 3 fathoms, including 2 rocks awash called the Cow and Calf, does not extend off the West side of Cranberry Island beyond 200 fathoms, but there are several rocky patches further off which carry 4½ fathoms, and therefore only dangerous to large ships when the sea is heavy; from the outermost of them the light-house bears S.E. by E. ¾ E., 460 fathoms. Proceeding to the Northward, the next danger bordering the channel is the Frying-pan Reef, running out N.W. by W., 400 fathoms, from the low Frying-pan Islet, and separated by a narrow channel from the Pas Reef, which runs out half a mile in the opposite direction, or S.E. by E. from Petit-pas. From Pas Reef the edge of the shoal continues to the Westward, skirting Petit-pas at the distance of 150 fathoms, and then crossing the bay, between it and Grassy Island, where it joins the shoal water off the latter.

Pas Reef.

Grassy Reef.

GRASSY REEF is extremely dangerous. Projecting from the S.E. extremity of Grassy Island, a quarter of a mile S. by E., it diminishes the breadth of the deep water, between it and the equally dangerous Mackerel Rock, to 130 fathoms, and as the channel is crooked there, as well as narrow, they form a difficult pass for large vessels.

We have now only to notice the shallow water extending 100 fathoms off the S.W. side of Grassy Island, before we arrive at the beach of Fort Point, which is quite bold; and after which the channel, although much narrowed by Grave Island, is direct and clear to the harbor.

Canso Harbor.

To enter Canso Harbor from the Southward, with a leading wind, proceed as follows:—Having first studied the foregoing description with reference to the chart, for the nature and appearance of the objects and dangers on either side—

At any distance not less than 3 miles, bring Cranberry Island light-house to bear N. by W. ½ W., when Crow Island will be in one with, and seen over it. Steer for the light-house on that line of bearing, taking care not to open the whole of Crow Island out to the Westward of Cranberry Island (for fear of the Cape Breaker) until the Roman Catholic church steeple at Canso is seen to the N.E. of Glasgow Head (bearing N.W. ½ N.) As soon as that steeple opens to the N.E. of Glasgow Head, steer N.N.W. ½ W., or so as to make a direct course towards the S.W. side of Petit-pas; and there will be no difficulty in passing between the Black Rocks, which can always be seen, and the shoals off Cranberry Island, if attention be paid to the leading-marks for clearing the last-named dangers. Continue the course towards Petit-pas, taking care that the Cape Rock is kept open to the Eastward of the Black Rocks, until Flag Hill comes in one with the *steep bank* of Fort Point, bearing N.W. Then steer N.W. on the last-named leading-marks, taking care not to open Flag Hill in the least to the S.W. of the *steep bank* of Fort Point until the Eastern extremities of Petit-pas and

Oliver Island come in one, bearing N.E. ½ E. Then change the course instantly, and steer W.N.W. for the Roman Catholic church at Canso, until Petit-pas and Crow Islands are touching, and then N.W. ½ W., for the S.W. end of Grave Islet, keeping Walsh's house (on Durell Island, on the N.E. side of the entrance of the Tickle) just open to the S.W. of it, by which the vessel will pass midway between Grassy Reef and South Shoal, and clear of the shoal water off Grassy Island. As soon as the N.W. extremity of *the beach* of Fort Point bears N.E. change course to N. N.W. ½ W., or for the wharf and stores on the West side of Cutler Island, until Cranberry light-house and the Southern extremity of *the beach* of Fort Point come in one. Then steer N.W. ¾ W., keeping the last-named leading-marks in one astern, and they will lead clear of the shoal off Grave Islet; round which, and at any distance from the islet between 60 and 120 fathoms, the vessel may haul to the Westward into the harbor.

The intelligent seaman, after having once become acquainted with the appearance of the various objects, dangers, and leading-marks, would find little difficulty in varying his mode of proceeding, so as to suit the cases of a scant wind from either side, or even in beating in, if his vessel were not too large, and the weather favorable: but the risk of being surprised by the prevalent fogs, among so many dangers, should always be borne in mind, when about to take this channel.

Canso Harbor, N.W. Entrance.

The difficulties of the N.W. entrance of Canso Harbor arise principally from the narrowness of the channel between Cutler and Piscataqua Islands, where the deep water is less than 40 fathoms wide; and from the position of the Starling Rock being so much in the way. It is a passage that should not be attempted in a large vessel without a fair and steady breeze; for although the dangers about to be described are for the most part visible, yet there is no safe anchorage in the event of the wind failing, the bottom being of rock.

Net and Whitman Rocks.

On the Western side of the entrance the dangers are, the Net Rocks, dry at a quarter ebb; and Whitman Rock, with 2 feet least water. They both lie off the East side of Durell Island, at the distance of 200 fathoms; the first being distant 560 fathoms, and the second 350 fathoms from the North end of Cutler Island, from which shoal water extends 100 fathoms towards them. The marks that just lead clear to the Eastward of both these rocks, and the shoal water around them, are the Roman Catholic steeple at Canso and the Western extremity of Cutler Island in one, bearing S. ¼ W. On the Eastern side of the entrance, and distant 150 fathoms from the North end of Piscataqua Island, will be seen Bald Rock, of bare granite, 70 fathoms long, and 30 feet high. It lies directly opposite to Whitman Rock, and the channel between them is 200 fathoms wide. There is a rock, dry at low-water, 100 fathoms outside or to the N.N.E. of Bald Rock, and shoal water 50 fathoms further off in the same direction; but off the West side the shoal does not extend beyond 50 fathoms, and is cleared by the above Roman Catholic steeple and the house on Cutler Island in one, bearing S. ¾ W.

Bald Rock.

The only other danger on this side of the entrance, is the reef off the N.W. point of Piscataqua Island, which is partly dry at low-water, and extends 75 fathoms out to the N.W. This reef will be cleared if the steeple be kept open to the Westward of the house on Cutler Island; or by Glasgow Head and Piscataqua Island touching, and bearing S.S.E.

Starling Rock.

STARLING ROCK, lying 115 fathoms S.E. by S. from Cutler Island, and 60 fathoms off the Western shore of Piscataqua Island, and in the very line of the narrow channel between these islands, with only 4 feet over it at low-water, renders this entrance extremely dangerous to strangers, for the channel between this rock and the shoal water, which extends 125 fathoms off the South end of Cutler Island, is only 40 fathoms wide. Lanigan's old house only just open to the Eastward of Grave Islet, will lead through this narrow pass; but to render it safe and easy to strangers, two beacons are much required: one on Grave Islet, and the other should be properly placed on the hill to the Southward.

To enter Canso Harbor by this N.W. channel proceed as follows:—Being outside the Net Rocks, bring the Roman Catholic church steeple at Canso to bear S. ½ W., when it will be seen over Cutler Island, midway between the house on the island and its Western end. Steer S. ¼ W. for the church steeple so seen, and it will lead in nearly midway between Bald and Whitman Rocks; and when the red clay cliff of Glasgow Head is seen through the channel between Cutler and Piscataqua Islands, bearing S.S.E., steer for the Head, keeping in mid-channel until the South end of Cutler Island bears W.S.W.; then again change the course, and steer for Grave Islet, keeping Lanigan's old house only just open to the Eastward of it, and after running 200 fathoms, or no further than when Cranberry light-house appears in one with Fort Point, haul to the Westward into the harbor.

Tides.

It is high-water, on the full and change days, in Canso Harbor, at 7 hours 48 minutes after the moon's transit; the rise in ordinary spring and neap tides being 6½ feet

and 4½ feet, respectively. The duration of the rise and fall, and, still more, of the streams, is influenced by winds or other causes; but the rate of the streams in the N. W. entrance of the harbor, where they are strongest, does not often exceed one knot. The flood comes from the Southward, the ebb from the opposite direction.

Hog, Cook, Welsh, and Derabie Islands and Rocks.

The small islands lying outside Canso Harbor, and not previously mentioned, have the names of Hog, Cook, Welsh, and Derabie, and with many nameless rocks, form a chain 1½ mile long in an E.S.E. direction, terminating with the East Rock, which is of bare granite, 20 feet high, and distant a long half mile N.N.E. from Crow Island. Rocks awash, and shallow water, continue from the East Rock 400 fathoms to the Eastward; but on the North side these islands are bold to within a cable's length, excepting at their West end, where Black Rock and the shoal around it extend 200 fathoms from Hog Island to the Northward. Black Rock, which is seldom if ever entirely covered, is half a mile E.N.E. of Bald Rock, and between them lies the entrance to a channel between Piscataqua and George Islands, which is full of rocks, and only navigable by boats and very small fishing-vessels. The outer islands are occupied by fishermen during the season, but the North shore of George Island by the more permanent residents. All these islands are formed of granitic rocks, excepting Grassy Island and Petit-pas, and most of them are sparingly wooded with dwarf spruce-trees.

Black Rock.

East Rock.

The East Rock bears from Cranberry light-house N. ½ W., 1¾ mile; and to the East of the line joining them lie a number of dangerous rocks with deep water between them. The innermost of these, the Fanning and Scott Rocks, with 12 and 9 feet least water, respectively, lie on the Eastern edge of the Cranberry Island bank, and at the distance of half a mile from the light-house: while Park Ledge, always above water, Crow Reef, and Budget Rock, are in like manner nearly united by shoal water to Crow Island. There is a deep channel between Budget Rock and the Frying-pan, but it is narrow, and destitute of good leading-marks. Next outside of the dangers which have been mentioned, are the Kelp Rocks, Inner Bass, Middle Rock, and Broad Shoal: of these, the first and last have 12 and 9 feet least water, respectively, and only show when there is a sea running; but the Inner Bass is awash at low-water, and the Middle Rock having only 4 feet water, can almost always be seen.

Middle Rock.

From the Middle Rock, the light-house bears S.W. by W. ¼ W. 1½ mile: and the Roman Catholic steeple at Canso is seen over Petit-pas, and open a little to the Southward of Park Ledge. The breakers on this rock and the Inner Bass, which lies 340 fathoms from it to the N.N.W., often serve as a guide to fishing and coasting vessels, which prefer passing close to them to going round outside all; but this cannot be recommended for large ships, for although the passage between the Middle Rock and Bass Rock is a mile wide, yet the Sand Shoal and White Rock, with 5 and 4 fathoms, respectively, and another nameless patch of the same depth as the latter, render it unsafe in the heavy swell which so frequently prevails.

Sand Shoal. White Rock.

Bass Rock.

BASS ROCK has 6 feet least water, and therefore breaks frequently. From it the light-house bears W. by S., 2¼ miles; and the Roman Catholic steeple at Canso and the Southern extremity of Petit-pas appear in one.

Grime Rock.

GRIME ROCK has 12 feet least water, and is therefore only shown by breakers when the sea is heavy. It lies further out than the Bass Rock, from which it bears N.E., 370 fathoms; and there is a patch of 28 feet of water a quarter of a mile to the Eastward of it. From Grime Rock the light-house bears W.S.W. ¾ W., distant 2¾ miles, and the Roman Catholic steeple at Canso, the Southern extremity of Grassy Island, the Northern end of Petit-pas, and Park Ledge, all appear in one, and open a little to the Southward of Crow Island.

Pope Rock

POPE ROCK has 5 feet water; from it the light-house bears West, 5 miles distant.

These last-named rocks are the outermost of the Canso Ledges, and lying off a great headland, which so many vessels are continually rounding, and in a region celebrated for fogs, they are exceedingly dangerous; but they have been rendered even more so by the errors of the charts hitherto in general use, in which they are represented fully half a mile too near the light-house.

In passing round these dangers in thick weather, great caution and the constant use of the lead are indispensable. If the approach be from the Northward, remember that they lie only 400 fathoms within the 30-fathoms edge of the bank; if from the Southward and Eastward, go into no less than 25 fathoms until the soundings indicate that the vessel is off the bank to the Northward; and lastly, in clear weather, do not haul to the Westward into Chedabucto Bay until the high land of Black Point opens to the Northward of Derabie Island, bearing W.N.W.

Fox Rocks.

Proceeding Westward from Canso, we have first to notice the Fox Rocks, lying between Durell and Fox Islands, and dry at low-water. They lie off Lazy Head, the Outer Fox being half a mile off shore, and the same distance Eastward from Fox Island. Neither of these rocks lie outside the line joining the North extremities of the

islands, and are therefore not much in the way of vessels running along the coast. The North point of Fox Island and the pitch of Black Point in one, clear the Outer Fox in 5 fathoms; and also the shoal off Tickle Island.

Fox Island. FOX ISLAND, 4½ miles to the Westward of Canso, is granitic, half a mile long, and 40 feet high. There are rocks, above and under water, off both ends of this island, to the distance of 2 cables' length; and it is connected with a shingle point of the main-land, distant 350 fathoms, by a bar of sand and stone nearly dry at low-water. The shingle beaches on the main-land and on the S.W. side of the island are covered with the huts of the fishermen, who resort here in great numbers during the season; this being one of the greatest fishing-stations in these seas, especially for mackerel and herrings. The fishing vessels lie in Fox Bay to the Westward of the island, in 4 to 7 fathoms, sandy bottom; but this anchorage is insecure, being exposed to Northerly winds, and also to the heavy Easterly swell which occasionally rolls in round the reef. In N.W. winds and fine weather, these vessels sometimes shift round to the Eastward of the island, but the ground there is rocky and the anchorage unsafe.

Fisheries.

Half Island Cove. HALF ISLAND COVE, 4½ miles from Fox Island, affords a small and unsafe anchorage, being open to the winds and swell from the North and East. Off the small island, on the West side of this cove, there is a dangerous rock, lying 100 fathoms from it out to the Eastward.

Philip Cove. PHILIP COVE, 2 miles further to the Westward, affords shelter to boats; the sea being kept out by rocks in the entrance, that become dry soon after high-water.

Crow Harbor. CROW HARBOR, celebrated for its mackerel and herring fisheries, is a mile from Philip Cove, and 12 miles to the Westward of Canso. It has excellent holding-ground and water enough for the largest ships; but there is not room for many large vessels in the Eastern part of the harbor, where alone they would be secure from the heavy Atlantic swell that occasionally rolls in.

Fisheries.

Rook Island. ROOK ISLAND is a rock 100 fathoms long, lying nearly in the middle of the entrance; and Rook Rock, with 3 feet least water, lies 35 fathoms off the N.W. extremity of the island, with deep water close to it. The channel to the Westward of the island is 17 fathoms deep, and 300 fathoms wide at the entrance, between Rook and Corveau Rocks, which last are dry at low-water, and form part of the reef of Lamb Point.

Rook Rock.

Brodie Rocks. The channel to the Eastward of the island, between it and the Brodie Rocks, is generally preferred with Easterly winds, although only 23 feet deep, and 100 fathoms wide. The Brodie Rocks, which become dry at low-water, form part of the reef that extends 225 fathoms from Lazy and Brodie Points towards Rook Island, giving security to the Eastern part of the harbor. The mark for clearing these rocks and the shoal water within them on the N.E. side of the harbor, is Lamb Point and the extreme land to the Westward in one, bearing N.W. by W. In the absence of buoys and beacons, vessels wishing to enter this harbor should proceed as follows: First, in approaching from the Eastward, to avoid the shoal that extends 150 fathoms off Lazy Point, bring the East end of Rook Island to bear nothing to the Westward of S.W. by W., and steer for it until within the distance of 2 cables' length; then change course to S.S.W., or, as may be necessary, to pass between 50 and 150 fathoms to the Eastward of that island. When the vessel has run 150 fathoms past the island, the marks already given for clearing the Brodie Rocks, and the shoal water on the N.E. side of the harbor, will come on, and enable her safely to haul in to the S.E., and choose her berth in 6 or 7 fathoms, on a mud bottom. Secondly, in approaching from the Westward, to avoid the shoal off Lamb Point, as well as the Corveau Rocks, bring the West end of Rook Island to bear nothing to the Eastward of S.E. by S., and steer for it until within the distance of a quarter of a mile; then change course to the Southward, so as to pass a cable's length or more to the Westward of the island; and then steer about S.E., passing at the same distance from the island, and having regard to the leading marks for clearing Brodie Rocks, she may take a berth as before.

Tides. It is high-water, on the full and change days, in Crow Harbor, at 8 hours, and the rise is from 6 to 4 feet, as it may be spring or neap tides. There is little or no stream of tide within the harbor.

Crow Cliffs. Proceeding Westward at the distance of half a mile beyond Lamb Point, we arrive at the first of three remarkable high clay cliffs, which point out the position of Crow Harbor from a distance:—after which, there is nothing deserving particular notice along the hilly, bold, and rocky coast, until we arrive at Salmon River; unless it may be Half-way Cove, as affording a landing-place for boats.

Half-way Cove.

Salmon River. SALMON RIVER, 8½ miles from Crow Harbor, is navigable for boats to the distance of 2 miles in from its very narrow entrance, on the bar of which the depth is only 3 feet at low-water. Shoal water extends a quarter of a mile out from the entrance, and a rocky ridge with 4 fathoms least water projects three-quarters of a mile further to the Eastward. Bigby Head, a remarkable cliff 100 feet high, separates this river from Toby Cove, another place for boats, with 4 feet on its bar at low water.

GUYSBOROUGH HARBOR, at the head of Chedabucto Bay, lies a mile N.N.W. from Bigby Head, and 10 miles from Crow Harbor. It is an extensive inlet, running in to the Northward, with a depth of water sufficient for large ships; but with such a dangerous bar, an entrance-channel so narrow and crooked, and such rapid tides, that no written directions could be available. The assistance of a pilot acquainted with every local peculiarity of the tides and winds, is indispensable for the safety of a vessel, even of very moderate size, either in entering or leaving this harbor; as will appear from an inspection of the chart, and the following brief description: *Guysborough Harbor.*

The light-house stands on the Southern end of the shingle beach of Peart Point, which forms the West side of the entrance. It is a temporary structure of wood, small, square, and painted white; it shows a fixed light, 30 feet above the sea, and visible from a distance of 7 or 8 miles. The entrance-channel, between Peart Point and Stony Patch, is 40 fathoms wide and 6 fathoms deep; but further out, and stretching across from Toby Point to Hadley Beach, there is a bar of sand, with 17 feet on it at low-water, and which is rendered impassable at times by heavy breakers. This is called the Outer Bar. *Guysborough Light.* *Outer Bar.*

THE INNER BAR lies across the inner entrance, which is 115 fathoms wide, between Eliza Point and Hadley Beach. The depth that can be carried over it is 13 feet at low-water, in a channel only 40 fathoms wide. Before arriving at this bar, there is room enough for a vessel or two to anchor in the mouth of Ingersol Creek, out of the strength of the tide, and sheltered from the sea by Stony Patch. The course across the Outer Bar, in the deepest water, is W.N.W., steering for the light-house until within the distance of 100 fathoms; then curving gradually to the Northward and Eastward, as the vessel passes the beach of Peart Point at the distance of 30 fathoms, and crosses the mouth of Ingersol Creek to the Inner Bar. The course then becomes E.N.E. for a cable's length, while crossing that bar; and then Northerly, through a clear and deep channel, for three-quarters of a mile, to the safe and spacious anchorage of the town. *Inner Bar.*

GUYSBOROUGH is advantageously situated on the Western side of the harbor, the deep water approaching close to its wharves. The hills attain the height of 500 feet on either side of this beautiful inlet, which is navigable for ships up to the Narrows, where the depth is 8 feet at low-water, at 4 miles from the entrance. Small vessels may proceed 3 miles still further, and boats to the bridge, where the tide ends, at 8½ miles from the entrance; and where Guysborough River, a small stream, enters the inlet, flowing through rich meadows, called the Guysborough Interval. *Guysborough Town.*

It is high-water, on the full and change days, on Hadley Beach, at 8h. 20m. after the moon's transit; the rise in ordinary spring-tides being 6½ feet, and in neap tides 3½ feet. The rate of the streams, in the narrow entrance of the harbor, is from 4 to 5 knots. *Tides.*

BRETON ISLAND, WEST COAST.

The Northern entrance of the Gut of Canso, from the light-house to Breton Island at Heffernan Point, is a distance of 1⅛ mile. For the first 7 miles we meet with no detached dangers, nor does the shallow water anywhere extend to the distance of half a mile from the shore. The land is high, and rather barren-looking, rising, at the distance of half a mile from the shore, to the summit of a ridge 850 feet above the sea, and which continues parallel to the coast-line for 5 or 6 miles. The only remarkable object in this interval is the Roman Catholic church at Craignish, which will be seen bearing N.E. ½ E., and distant 2¾ miles from the light-house. At Long Point, a low cliff of red sandstone, the coast becomes dangerous of approach, and continues so to Emersion Head, a distance of 7 or 8 miles. *Breton Island, West Coast.*

JUDIQUE SHOAL, the greatest danger in the bay, is of rock, and about half a mile in length, if we reckon only the very shallow part; but there are patches with 2 and 3 fathoms, and much rocky ground both to the North and South of it, as will be seen in the chart. *Judique Shoal.*

On the outer and N.W. point of the shoal, the church at Port Hood is only just shut in behind Susan Point, bearing N.N.E.; Long Point bears S. by E. 2¾ miles; Campbell Point (the nearest part of the shore) E. ½ S. 1¼ mile; and Judique church (a large wooden building without a steeple) N.E. by E. The least water (4 feet) is close to the outer point of the shoal, and when on it, the Western extremity of the high land of Cape Porcupine will appear in the same line as Flat and Heffernan Points, which form the right extremity of Breton Island at the entrance of the Gut of Canso, and which bear S. ½ W. If the whole of the high land of Cape Porcupine

be kept open to the West of Heffernan Point, the shoal will be cleared in 6 or 7 fathoms: or if the church at Port Hood be kept open to the West of Cape Susan, the shoal will be cleared in not less than 4 fathoms. There are 4 fathoms of water between this shore and the land, but only small craft should attempt the passage.

Judique Bank. JUDIQUE BANK lies 2¾ miles N.N.W. from the shoal, with 4½ fathoms least water, on a small rocky patch, with a great deal of foul ground around it. When on this patch, Portsmouth Point (the South end of Smith Island) and Cape Linzee will appear touching, and bearing N.N.E. ½ E.; Judique church, E.S.E. ½ E., 3¼ miles; and the left or Eastern termination of the high land of Cape Porcupine just shut in behind Heffernan Point. This bank, which is only dangerous to very large ships when there is a heavy sea running, will be cleared by keeping Cape Linzee shut in behind Smith Island; or the whole of the high land of Cape Porcupine open to the Westward of Heffernan Point.

Judique Pond. JUDIQUE POND, close to the North of the church, is barred by a sandy ridge, so as only to admit boats at high-water. The shallow water extends off it to the distance of 1¼ mile. Catherine Pond and Susan Creek, distant 3 and 5 miles respectively to the North of Judique church, are similar places; the latter admits boats at high-water, and is situated just to the North of Cape Susan, rendered remarkable by the white gypsum in its cliffs.

Port Hood. PORT HOOD,* the only safe anchorage on the West Coast of Breton Island to the North of the Gut of Canso, was formerly a much more secure harbor; Smith Island being then a peninsula, united to the main-land by a range of high sand-hills, which has since been entirely swept away, and the sand widely spread over the Northern parts of the harbor. The first breach in this sand-bar was formed by the sea about 20 years ago, during a heavy gale from the North; it was at first a very narrow channel, and might perhaps have been easily closed; but, being neglected, the tidal-streams enlarged it with increasing rapidity, until the present channel, 600 fathoms wide, and 9 feet deep at low-water, was formed between the island and the main-land. The combined action of the waves and tides is said to be still widening and deepening this passage, thus admitting more and more the heavy swell from the North, and thereby rendering the harbor insecure, excepting over towards Smith Island, the Eastern side of which forms a bay, where the anchorage is still perfectly safe with all winds. At this anchorage, in which vessels may choose any depth from 3 to 4½ fathoms, the bottom is of mud that holds well, and the heavy swell is prevented from rolling in round the N.E. extreme of the island by a long shoal, derived from the ruin of the sand-hills, and which runs to the Southward from Smith Point, with only 4 feet of water for the first 300 fathoms, and less than 3 fathoms for an equal distance further. This shoal must be carefully avoided in hauling in to the anchorage.

Spithead. The shelter from all South winds is complete, being afforded by the Spithead, which is a sandy flat nearly dry at low-water, extending 600 fathoms to the Eastward from Portsmouth Point, the South extremity of the island. The Spithead, which is very steep, and can usually be seen, will be cleared at the distance of 50 fathoms, by keeping the small fish-shed, on the wharf next within Smith Point, exactly in one with the chimney of the house behind it, bearing N. ¼ W.

Dean Shoal. On the opposite, or main-land side, there is also a steep sandy flat, called the Dean Shoal, which runs off from the sandy beach at Mill Creek to the distance of 300 fathoms; this, and the shallow water on that side, as far out as opposite Portsmouth Point, but not further to the South, will be cleared at the distance of 100 fathoms, by the line of Cape Linzee and Isthmus Point in one, bearing about N. by E. ¼ E. On the same side, but outside the entrance of the harbor, a rocky shoal, with 13 feet least water, runs out 360 fathoms from the shore, half a mile to the Northward of Ragged Point. This being very steep, must be carefully avoided by a large vessel. Cape Susan and Kate Point in one, bearing S. by W., just clears it, but may not be easily made out by strangers.

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

* See Plan.

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

This island is bold to seaward, but shallow water runs out from Fishery Point, its S.E. extremity, one-third of a mile to 3 fathoms, and three-quarters of a mile to 5 fathoms.

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

The village of Port Hood will be seen on the main-land opposite the Northern part of Smith Island: it is well situated, and will be recognized by the steeple of the Roman Catholic church, and the court-house of stone. *Port Hood Village.*

On the South entrance of the harbor there is a light-house 52 feet high; it is a fixed light with a small red light below it. *Light.*

The following directions, with reference to the plan, and to the foregoing description of the dangers and leading-marks, will enable the intelligent seaman to take his vessel in or out of Port Hood with safety:—Having a fair wind, pass to the Southward of Henry Island, at a distance not less than a quarter of a mile, steering E. by S. until the Roman Catholic church at Port Hood opens out to the Southward of Portsmouth Point, then change course so as to pass the latter at the distance of three or four hundred fathoms, or in not less than 5 fathoms of water; taking notice, that the shallow water off it extends to the distance of 210 fathoms. This course should be a little to the Northward of E.N.E., and directly towards a house rendered remarkable by its lower story being of stone, while the upper part is of wood, and which should be nearly in one with, or only just open to the Northward of, a hut near the entrance of a small brook at the North end of a range of cliffs. Continue the course thus indicated, until Henry Point (N. end Henry Island) and Portsmouth Point come in one; when change the course immediately, and steer directly for the Roman Catholic church, or N.E. ½ N., until the younger Smith's fish-shed (on the wharf next within Smith Point) comes in one with the chimney of his house, bearing N. ¼ W. Keep these marks exactly in one, running towards them, (they will lead in clear of the Spithead bank, as already mentioned,) and when the S.W. end of the elder Smith's barn comes in one with the chimney of his house, bearing N.W. by N., change the course, and steer directly towards them, until Cape Linzee comes in one with Smith Point; when the vessel will be in the best anchorage, and in 4 fathoms at low-water, with mud bottom. *Port Hood.* *Anchorages.*

If any difficulty be experienced in distinguishing the younger Smith's fish-shed, let the N.E. ½ N. course towards the Roman Catholic church be continued, until Isthmus Point and Cape Linzee are in one, then change the course, and keep them so, running towards them until the S.W. end of the elder Smith's barn comes in one with the chimney of his house, bearing N.W. by N.; and these last-named marks will lead to the anchorage as before stated.

It is high-water here, on full and change days, at 9 hours. The rise in ordinary spring-tides is 4½ feet, and in neap tides 2 feet. The tidal-streams are weak at the anchorage, and their rate does not ordinarily amount to one knot anywhere within the harbor. The flood comes from the North, and the ebb from the South. The flood-stream from the North meets that which comes in through the Gut of Canso off Long Point, whence they set to the N.W., curving round the bay towards Cape George. *Tides.*

At Cape Linzee, 1½ mile Northward from Port Hood, the West coast of Breton Island trends away to the N.E. by E., continuing in that direction to Cape St. Lawrence, a distance of 73 miles, without either harbor or safe anchorage for ships. The general character is high and bold, the dangers being few and close inshore, but it is nevertheless a dangerous coast to be near in autumn or early winter, when the prevailing N.W. winds send in a heavy sea, and the set of the current is often in the same direction. The swell frequently precedes the wind by many hours, and, as there is no good holding-ground, becomes dangerous to vessels caught close inshore. Even with a smooth sea, and in fine summer weather, vessels are set in towards this coast; an effect which seems to be due sometimes to the general current from the N.W. coming from between the Magdalens and Prince Edward Island, and at other times to the direction of the ebb-stream from the strait of Northumberland inclining towards these shores. These streams, being inconstant and irregular, both in strength and direction, are therefore the more dangerous, and require the more to be guarded against. In the summer months, however, the rate of the current or tides will not be found to exceed one knot, even close inshore; excepting round Cape St. Lawrence and Cape

North, where it sometimes runs at the rate of 2 or 3 knots, causing a heavy breaking sea. Its direction for three-fourths of the time is from the Westward; this appears to be due to the combined action of the current and ebb-tide predominating over the flood-stream from the N.E., so as to render it nearly imperceptible, excepting at or near the spring tides. There is no doubt that winds, present or at a distance, also influence these streams, as they have been observed to do in all parts of the Gulf.

Fisheries. The fisheries are valuable. Salmon are taken in all the principal streams, and Margaree is so celebrated for its salmon fishery that it has sometimes been called Salmon River. Herring, mackerel, cod, &c., abound in their seasons, and are frequently taken in large quantities.

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

Tides. The entrance, at the Southern end of a low sand-bar, is only 50 fathoms wide, and the tides frequently run there at the rate of 4 knots; it is therefore a dangerous place to enter, excepting with a flowing tide and a smooth sea. It is high-water there, on the full and change days, at about 9 hours; the rise in ordinary spring-tides is 4 feet, and in neap-tides 2 feet. N.E. winds often cause high tides; S.W. winds the contrary.

The scenery is very beautiful, the mountains rising immediately from the Northern shore to the height of 870 feet.

Mabou Highland. THE MABOU HIGHLAND is a very remarkable feature of the coast, seen from great distances out at sea. It extends 11 miles along the coast to the N.E., forming a lofty and precipitous shore, and rising to the height of 1000 feet above the sea. After passing these highlands, the coast becomes less elevated, the beaches and landing-places more frequent, and the settlements are continuous until we pass Chetican Island.

Sea-Wolf Island. SEA-WOLF ISLAND, distant 23 miles N.E. from Port Hood, is of an oval shape, 1100 fathoms long, parallel to the shore, 300 fathoms broad, and 200 feet high. It is of sandstone, precipitous, and quite bold all around, excepting at the N.E. point, and there the shallow water extends only to the distance of one cable. It affords some shelter to small fishing-vessels and boats, which can land upon it only in fine summer weather; at other times the sea rolls completely round it, and the anchorage is never safe, the ground being everywhere rocky.

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

Margaree River. MARGAREE RIVER,* which is 7½ miles further to the N.E., has 5 feet over its rocky bar at low-water, in a very narrow and intricate channel, through which the tides run at the rate of 4 knots. It is only under favorable circumstances of wind and weather, and with a smooth sea, that schooners can safely attempt to enter it. The surf on the bar is at times very heavy and dangerous to boats, especially when the strong tide is running out against the wind and sea. The shores of this river are well settled, principally by Acadians and Scotch highlanders, who, besides farming, prosecute the salmon and other fisheries.

Tides. It is high-water, on the full and change days, at 8h. 40m., the rise in ordinary spring-tides being 3½ feet and in neap tides 2 feet. Boats can ascend 5 or 6 miles from the entrance, at which distance the tide ends.

Between Margaree and Chetican there are several places where boats can land in fine weather, especially at Squirrel Pond, distant 3 miles from the last-named place. There are farms all along this part, the mountains running parallel to the shore, at a short distance back, and attaining, at Mount Squirrel, in rear of the pond of the same name, the elevation of 1220 feet above the sea.

Light. On Sea-Wolf or Margaree Island there is a light-house 55 feet high; it shows a red light on the Northern side, a bright light on the Southern side.

Chetican Island. CHETICAN ISLAND, distant 10 miles N.E. from Margaree, is only an island when high tides overflow the low and narrow beach of sand and shingle, which, at other times, unites it to the main-land at its Southern extremity. This beach forms the shore of the bay, within the S.W. point of the island, where the Jersey brig, employed in the fisheries, usually lies moored in the summer months; receiving some shelter from the shoal which runs out half a mile to the Southward from Chetican Point, but completely exposed to winds from between S.W. and N.W., which send in a heavy sea. The depth of water in this roadstead is 4½ fathoms, but the bottom, of sand and gravel, is so loose and bad for holding, that the anchorage becomes quite unsafe after the month of August; as was experienced by one of the Jersey vessels several years ago, when she was

* See Plan.

driven from both anchors, and completely wrecked on the beach; since which accident they endeavor to leave before the commencement of the September gales.

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

Chetican Harbor.

CHETICAN HARBOR,* between the island and the main-land, is entered from the N.E. between the shingle spit at Gros Cape, the N.E. extreme of the island, and Caveau Point. Within this entrance, but outside the bar, which is half a mile further in, small fishing-vessels sometimes anchor, but the Northerly winds send in so heavy a sea, that this is considered even less secure than the unsafe anchorage at the S.W. end of the island. There is a depth of 3½ fathoms within the harbor, but only 2 feet at low-water over its bar of sand, which is then in great part dry.

Tides.

It is high-water here, on the full and change days, at 8¼ hours; the rise in ordinary spring-tides is 3½ feet, and in neap tides 2 feet. N.E. winds cause high tides, and S. W. winds the contrary.

Caveau Shoals.

THE CAVEAU SHOALS are two rocky patches, with 11 feet least water, lying at the distance of half a mile off Caveau Point, and from one-third to three-quarters of a mile from Gros Cape, on a N.E. by E. line of bearing. They are much in the way of vessels wishing to anchor off the entrance of the harbor.

Jerome Ledge.

THE JEROME LEDGE, with 5 feet least water, lies in the same direction from Gros Cape, and at the distance of 1¾ mile. It is of considerable extent, being two-thirds of a mile long, and its N.E. point reaches to the distance of a mile out from the shore. The line of 10 fathoms water is only 300 fathoms outside this ledge and the Caveau Shoals: there is therefore little warning from the lead; but vessels beating along shore, and standing towards them, will avoid them by tacking when the points on the outside of Chetican Island, namely, Enragée Point and the Capes, come in one, bearing S.W. ¾ W.

Presqu'ile.

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

Grandance.

Cape St. Lawrence.

CAPE ST. LAWRENCE, which forms the termination of the West coast of Breton Island, is of slate rock, affording no landing excepting on the West side, where there is a brook, and a steep stony beach, on which a boat can be hauled up with difficulty. Proceeding round this headland to the S.E., we first observe the remarkable Bear Hill, a sugar-loaf 750 feet high, and close to the shore. This is distant less than a mile from the cape; and at an equal distance further on Black Rock will be seen, always above water, and about 160 fathoms off shore. Meat Cove, where there is a settlement, and good landing for boats, lies 300 fathoms further in the same direction, and one mile N.W. from Black Point.

Bear Hill.

Black Rock.

Meat Cove.

St. Lawrence Bay.

ST. LAWRENCE BAY, between Black Point and Cape North, is 4½ miles wide and 1¾ mile deep, with bold shores, and a depth of water not too great for anchoring; but the bottom is not to be trusted, being either of rock or loose sand. Vessels requiring supplies may anchor there in the summer months, when strong Northerly winds are of rare occurrence, and will find 9 or 10 fathoms water at the distance of half a mile off shore in the bottom of the bay, but they should be ready to weigh immediately on the approach of a wind from the sea. At Wreck Cove and Deadman Pond there are settlements, and good landing, the principal fishing-establishment being at the last-named place.

Wreck Cove.

Deadman Pond.

Cape North.

CAPE NORTH, the N.E. extremity of Breton Island, is a very remarkable, bold, steep, and rocky headland, of slate, in nearly vertical strata, rising abruptly from the sea to the height of 1100 feet. There is no shallow water off it, only some rocks above water, which at Money Point, a mile to the S.E. of the cape, run off to the distance of a long cable. The passage between this headland and the Island of St. Paul is 13 miles wide, with very deep water, and no other danger than that which arises from the frequent and heavy squalls which prevail off this great promontory.

BRETON ISLAND, N.E. COAST.

BRETON ISLAND, N.E. COAST.—The N.E. coast of Breton Island, from Cape North to St. Anne's Harbor, a distance of 47 miles, is bold, mountainous, and

* See Plan.

free from outlying dangers, until we arrive near Ciboux Island, hereafter to be noticed. The mountains attain the elevation of 1390 feet above the sea.

Notwithstanding the bold nature of this coast, wrecks have not been unfrequent upon it in the dense fogs which accompany the Easterly winds. They have generally occurred to vessels running and steering, as they supposed, a safe course, to pass St. Paul's Island into the Gulf of St. Lawrence. Unaware of, or not allowing for, the current so frequently found running out of the Gulf from the Northward, and which had been acting upon their starboard bows for many hours, setting them many miles to the S.W of their reckoning, they ran on shore under full sail. On one occasion we found this current running out of the Gulf for many successive hours, at the rate of 2 knots from N.N.E.; at another time its rate was one knot from N.N.W.; and at a third it was imperceptible. After long-continued winds from the E. or N.E., which raise the level of the water in the Bras Dor and neighboring harbors, it is not unusual to find a current of one knot running for several successive days along the land from off St. Anne to near Cape North, where it meets the current out of the Gulf, and is turned to the Eastward with a great rippling. The fishermen affirm that it as often runs in the opposite direction; and again, that at other times there is a regular alternation of the flood and ebb streams.

Currents.

These remarks are intended to show the inconstant nature of these currents, and the consequent great care required for the safety of a vessel when approaching this neighborhood in the fogs which so often hide the lights on St. Paul's Island.

There are only two anchorages, and those unsafe, in the portion of coast under review: The first of these, Aspee Bay, is 8 miles wide, and 4½ miles deep. On its North side, and distant 5¾ miles S.W. by W. from Cape North, is Wilkie Sugar-loaf, a remarkable conical hill 1200 feet high.

Aspee Bay.

To the Southward of this, and occupying the head of the bay, are three ponds with narrow entrances through sandy beaches, and into which boats can only pass at high-water. The Northernmost and largest of these ponds has several islands in it, and a depth of 3 fathoms; it extends 3 miles inland, and has at its head a large brook called Aspee River. It has often a depth of 3 feet in its entrance after the melting of the winter's snows, but in summer seldom more than a foot at low-water. There are settlements at all these ponds, where fresh provisions and water may be obtained. The best anchorage with N.W. winds is off the North Pond, in 8 or 9 fathoms, sand bottom; and with South winds off the South Pond, or in the cove under White Head, which, with a small island lying close off it, forms the S.E. point of the bay. In this cove there is a settlement for prosecuting the fisheries, and good landing for boats in all but Northerly winds. It is the anchorage generally preferred, especially by small vessels, as being the least embayed, and the most sheltered from the prevailing swell from the S.E. To vessels unable to beat round Cape North, or in want of supplies, this bay affords convenient anchorage; but it is only safe in fine weather, and with Westerly winds: a vessel should therefore be in readiness to weigh instantly on the approach of a wind from the opposite quarter.

Aspee River.

Cape Egmont.

CAPE EGMONT, distant 12 miles to the Southward from Cape North, and 3 miles S.S.E. from White Head, is a comparatively low headland of granite, and nearly bare of trees. The coast there turns to the S.S.W., and at Neal and Blackbrook Coves, which are distant 2½ and 4 miles, respectively, in that direction, there is good landing for boats. Off South Point, between those coves, there is a sunken rock 2 cables' length off shore; and there is also a rocky shoal, with 2 fathoms least water, half a mile from the shore at Rocky Bay, where there are several buildings, 2 miles to the Northward from Inganish.

Inganish Island.

East Rocks.

INGANISH ISLAND is distant 10 miles from Cape Egmont, and half a mile S.E. from Archibald Point, the North point of Inganish Bay. The island is of rock, half a mile in diameter, and 206 feet high. The East Rocks, 12 feet high, lie off it to seaward, and extend out to the distance of nearly 400 fathoms. There are several high rocks close to the outer shores of the island, and one small one off its S.W. extremity at the distance of 80 fathoms. The N.W. side of the island forms a small bay, in which there are several buildings, and where the small fishing-vessels and boats are sheltered from the swell from the Southward, and from all but Easterly winds.

From the West point of this small bay a spit and reef extend nearly half-way across to Archibald Point, leaving a channel of 18 or 20 feet in depth, but so narrow and crooked, that only 14 feet can be relied on at low-water.

Inganish Bay.

Fisherman Rock.

Inganish Bay, between Archibald Point and Cape Smoke (Cape Enfumé,) is 3¾ miles wide, and 2¾ miles deep. It is divided into North and South Bays by Middle Head, a long, narrow, rocky, and precipitous peninsula, off which lies Fisherman Rock at the distance of a cable's length to the S.E. At the head of South Bay there are two ponds, having a common outlet, which boats can enter only at high-water. There are several houses near these ponds, as well as on the tongue dividing the two bays, and at some parts of North Bay; but the principal settlement of Inganish is on the

North side of the bay, where, besides the establishment of Mr. Archibald on the inner side of the point, which bears his name, there is a small Roman Catholic chapel, together with most of the houses and fish-stages. Vessels usually anchor on the North side of the bay within Archibald Point, shifting their berths as the winds may render necessary; but the bottom is in general only a thin coating of sand over rock, and the anchorage consequently unsafe, especially with Easterly winds, which send in a very heavy sea.

The mountains in rear of Inganish are the highest on this coast, attaining an elevation of 1390 feet; and Cape Smoke, its South point, rises precipitously from the sea to the height of 950 feet. The squalls from these highlands are at times very violent. *Cape Smoke.*

It is high-water, full and change, at Inganish, at 8h. 11m., M. T.; the rise in ordinary spring-tides is 3 feet 11 inches, and in neaps 2 feet 9 inches. *Tides.*

Proceeding to the S.W. from Cape Smoke to Bentinck Point, a distance of 12½ miles, the coast assumes a less sterile appearance; the mountains receding a short distance from the shore, so as to leave space for scattered farms. At a brook called French River, and especially at Breeding Cove, there is good landing for boats. At the first-named of those places, the 30-fathoms line of depth turns off to the S.E., and passes outside the Ciboux Shoal: thus affording sufficient guidance to those vessels that do not neglect the duty of sounding at night or in foggy weather. *Bentinck Point.* *French River*

In the next distance of 5½ miles, which brings us to Island Point, the shallow water extends 400 fathoms off shore; as it does also in the remaining distance of 3½ miles to St. Anne's Harbor. At the distance of 1½ mile past Bentinck Point there are cliffs of white gypsum; and at Indian Brook, one mile North from Island Point, there is good landing. *Island Point*

Island Point looks like an island, but is a small wooded peninsula, joined to the mainland by stony beaches inclosing McDonald Pond.

ST. ANNE'S HARBOR* (formerly Port Dauphin) is capable of containing any number of vessels in security; but the entrance is very narrow, with a tide of 4 knots; and there is a dangerous bar outside, over which a depth of 16 feet can be carried at low-water, with the aid of the Admiralty chart and these directions. Without such assistance, a stranger unacquainted with the leading-marks, could only safely rely on finding 12 feet instead of 4½ fathoms, as erroneously stated in the charts and directions heretofore in general use. *St. Annes Harbor.*

In a strong N.E. wind, and especially when the tide is running out, the bar is covered with heavy breakers. The harbor is completely sheltered by Beach Point, which is formed of large rolled stones and shingle, and reaches across from the Northern to within 90 fathoms of the Southern shore: it is quite bold at its Southern extremity, and the entrance-channel between it and Weed Pond Shoal is 13 fathoms deep, but only 65 fathoms wide. Within the entrance, on the North side of the channel, lies the Port Shoal, of mud, extending half a mile in from Beach Point, and just cleared to the Southward by the line of Weed Pond Beach and Bar Point in one. *Beach Point.* *Port Shoal.*

On the Eastern side of the entrance the small green mound of the old fort will be easily recognized: its summit forms with the plaster, or white gypsum cliff of Macleod Point, in the head of the harbor, a leading-mark for crossing the bar in the best water. *Bar Mark.*

Immediately outside of Old Fort Point the stony Weed Pond Beach commences, from which a rocky ledge, with 2 feet least water, extends to the distance of 40 fathoms, and continues Eastward to Bar Point, half a mile from the entrance. *Weed Pond Ledge.*

The marks for clearing this ledge, which is much in the way of vessels in this narrow channel and rapid tideway, are Lead-in Point and Conway Point in one: these are the two points next within Old Fort Point, on the South shore of the harbor. Proceeding out along the Southern shore, Wilhausen Point will be easily distinguished, being the first point of cliff outside the entrance; and so also will Fader Point, which is likewise a cliff, and just beyond the beach of Oyster Pond. These points are distant three-quarters and 1¼ mile, respectively, from the entrance, and, together with the objects previously mentioned, form the principal leading-marks for entering or leaving the harbor.

Further out, the South-eastern shore of the bay is quite bold all the way to Cape Dauphin, and the only remarkable object is Monroe Beach and Store, where there is good landing for boats with off-shore winds.

Vessels bound to St. Anne's Harbor with a fair wind should proceed as follows, referring, for the leading-marks, to the Admiralty chart, and the preceding remarks:

Approaching from the Northward, pass to the N.W. of Ciboux and Hertford Islands; avoiding, if it be wished, the rocky 6-fathoms fishing-ground, in the mouth of the bay, by keeping well over towards Cape Dauphin. Go no nearer to the shore between Bentinck and Island Points, than the depth of 7 fathoms. Observe that the line of Bentinck Point and Cape Smoke in one clears the shoal off Island Point in 5 fath- *St. Anne's Harbor Entrance.*

* See Plan.

oms; and that in approaching the bar, Cape Smoke should be kept open. Before arriving at the steep outer side of the bar, which is distant one mile from the entrance, bring the white gypsum cliff of Macleod Point in one with the summit of Old Fort,* and steer for them until Fader Point is seen only just open clear of Wilhausen Point (the vessel will then be only 40 or 50 fathoms from the shore near Bar Point); then port the helm instantly, and run from the last-named leading-marks, keeping Fader Point a little open, until Conway Point makes its appearance to the Westward of Lead-in Point, or until the gypsum cliff of Macleod Point is open only half a point to the Southward of Beach Point, or until the latter bears S.W. by W., and is distant a quarter of a mile; then again change course, and keeping Conway Point in sight, (to avoid Weed Pond Ledge,) steer so as to pass Beach Point at a distance between 30 and 50 fathoms. Having now entered the harbor, avoid Port Shoal, by not opening out Bar Point to the Northward of Weed Pond Beach, until the shingly Price Point bears to the Northward of N.W.; the vessel will then be within the shoal, and may haul to the Northward, and anchor to the Westward of it in 8 fathoms, mud, and out of the stream of the entrance. But the best-sheltered anchorage is in the entrance of the North Arm: the riding elsewhere in so large a harbor being at times rather rough for a small vessel. The N.E. gales, on entering this harbor, between mountains 1000 feet high, and only 2 miles apart, blow with concentrated force. They may be expected at any time after the middle of August, and a vessel should be well moored to withstand their fury.

Port Shoal.

North Arm Anchorage.

Tides. It is high-water, within the harbor, on the full and change days, at 8h. 42m., M. T. The rise in ordinary spring-tides is 5 feet, in neap-tides 3¼ feet. Extraordinary tides rise 6 feet,

It is high-water 10 minutes earlier on the bar, and the rise is there less by about one foot. The rate of the tidal-streams in the entrance is from 3 to 4 knots. The best watering-place will be found on the Northern side of the harbor, 1¾ mile from the entrance, where a torrent descends a ravine in the mountains of St. Anne, which rise precipitously to the height of 1070 feet above the sea.

Monroe Cove. A reference to the chart will show the North Arm, which boats can ascend N. by E., 3 miles; also Monroe Cove, with Ship-yard Rock in its entrance; and the gypsum cliff and the reef at Macleod Point, which divides the head of the harbor into two arms. The Kirk, or Presbyterian chapel, stands near the head of a convenient boat-cove on the South side of Macleod Point, and near the Manse, or residence of the Presbyterian minister, whose flock of highlanders form the greater part of the inhabitants of the harbor. They subsist by very indifferent farming, aided by occasional employment in the fisheries, and in getting out lumber for ship-building.

Cape Dauphin. Ciboux Islands. CAPE DAUPHIN, the dividing point between St. Anne's Bay and the Bras Dor, is a high and precipitous headland, and the North-eastern termination of the range of mountains that separates them. Hertford and Ciboux Islands lie off it in a straight line N.E. by E.; and, including Ciboux Shoal, extend to the distance of 4½ miles. They are long and narrow islands of sandstone, precipitous on every side, nearly bare of trees, and half a mile apart. There is no passage for ships between them, but boats, or small craft, can pass through a narrow channel, which is distant from 50 to 100 fathoms from Hertford Island, and between it and the middle rock. Hertford Island is the highest, and 100 feet above the sea. It is distant from Cape Dauphin 1½ mile; but the dangerous Hertford Ledge, which has 5 feet least water, extends from it nearly half way across to the Cape, leaving a channel 600 fathoms wide and 7 or 8 fathoms deep. To avoid this ledge, vessels should keep well over towards the Cape, from which the shallow water does not extend beyond 2 cables' length. From the outer point of Ciboux Island a reef runs off half a mile to N.E. by E.: and Ciboux Shoal, with 15 feet least water, lies five-eighths of a mile further out in the same direction. This dangerous shoal, on which the sea at times breaks heavily, was only known to the fishermen previously to Capt. Bayfield's survey.

Hertford Island and Ledge.

Ciboux Reef and Shoal.

Great Bras Dor Entrance. THE GREAT BRAS DOR is the principal of the two channels, on either side of Boulardrie Island, leading to the interior sea called the Bras Dor Lake. Its entrance between Carey Point and Noir Point, is only 170 fathoms wide, with deep water; and, at a short distance outside the channel, is still further contracted by shoals to 110 fathoms; measuring from the depth of 3 fathoms on either side. Carey Point, the N. W. side of the entrance, is a shingle beach, quite bold at its Southern extremity, but having a dangerous shoal running out from it E.N.E., so as to form the Northern side of the channel outside for seven-eighths of a mile. On many parts of this shoal the depth is only 3 feet at low-water, so that it is shown by breakers when there is any sea running; and a wide bar commences immediately outside of it, and conti-

Carey Point Shoal.

* If the gypsum cliff of Mcleod Point cannot be made out, pass Wilhausen Point, at the estimated distance of 100 or 120 fathoms, steering for the Old Fort, until Fader Point is only just open; then proceed as already directed.

nues one mile further out, with irregular soundings, from 3 to 6 fathoms, over gravel and sand bottom. The shallowest part, (3 fathoms,) called the Middle Shoal, lies on the North side of the channel, and 1½ mile out from Carey Point. Nearly opposite to this, and on the South side of the channel, is Blackrock Shoal, extending from the red cliffs of Blackrock Point 200 fathoms to the North, and half a mile in a N.E. direction. *Blackrock Shoal.*

These are the principal dangers of the entrance; they render the channel indirect as well as narrow; and together with the rapid tides and the want of buoys and beacons, make this a very dangerous pass for a stranger to attempt; except under favorable circumstances of weather, wind, and tide. Further out, it is only necessary to observe, that the shallow water extends 150 fathoms off Table Islet, which will be seen lying close off the cliff of Table Head, and distant 3 miles from the entrance. Haddock Bank has 4 fathoms least water, and lies from 1 to 1½ mile off shore, midway between Table Head and Cunet Point: the last being the remarkable N.E. extremity of Boulardrie Island, formed of cliffs of the coal formation, which are fast yielding to the waves; and from which a rocky shoal extends to the distance of two-thirds of a mile. *Haddock Bank.*

Within the entrance, off the small bight between Duffus and Mackenzie Points, lies Eddy Rock, with one foot least water, and which will be cleared by keeping Blackrock Point open to the Northward of Noir Point. On the opposite or Northern side of the channel, from Carey Point to Kelly Cove, a distance of one mile, the shore is quite bold. To this cove, which is a convenient anchorage, we shall restrict our present notice of the Bras Dor, the object of this chapter being the North-eastern seaboard of Breton Island, leaving the description of its noble inland waters to a future page. *Kelly Cove.*

Off the mouth of Kelly Cove, in 5 or 6 fathoms, sand bottom, the anchorage is good, and out of the strength of the tide; but it is still more secure further in, within a cable's length of its head, where the bottom is of mud, and the depth 3 to 4 fathoms.

If the entrancec-hannel of the Great Bras Dor were buoyed, a large ship might back and fill in against the wind, with the aid of the strong tide; but without that guidance, a fair wind, and weather clear enough to allow the leading-marks to be seen, are indispensable. Having those requisites, proceed as follows: observing first, that Duncan Head, 4 miles within the entrance, shows like a well-defined point on the South-east side of the channel. Pay a due regard to the dangers which have been pointed out, off the points of the bay; and before advancing further in than Table Island, bring Carey Point and Duncan Head to touch, bearing S.W. by W. ½ W.; and steer for them until Cape Smoke and the North end of Hertford Island are in one; then change the course to the Southward and keep those marks in one astern, running from thence (for about 150 or 200 fathoms) until Mackenzie and Duffus Points come in one, when change course again and steer S.W. by W. ½ W. for them, or so as not to open out Mackenzie Point until Blackrock Point and Table Head come in one. These last-named well-defined points kept in one astern, or as the vessel runs from them, on a W.S.W. ½ W. course, will lead nearly in mid-channel through the narrow entrance between Carey and Noir Points; after which there is nothing in the way of a vessel hauling up for Kelly Cove. Should, however, the strong flood-tide carry her above the cove, she will find good anchorage 2 miles further in on the same side, in 5 fathoms, and to the Westward of Jane Point. *Bras Dor Entrance.*

If the weather should be so hazy that Cape Smoke cannot be seen, run in upon the S. W. by W. ½ W. course, with Carey Point and Duncan Head touching, until Blackrock Point is abeam; then sheer to the Southward until Mackenzie and Duffus Points come in one, and proceed as before directed.

It is high-water, on the full and change days, at Carey Point, at 7h. 30m. M.T.; the rise in ordinary spring-tides being 3 feet, and in neap tides 1⅔ foot. The usual rate of the tidal-streams in the entrance is from 4 to 5 knots; but in the spring, or after long-continued N.E. gales, which have previously raised the level of the Bras Dor, they may amount to 6 knots. They form strong ripples and eddies, especially off Carey Point. *Tides.*

In fine settled weather the stream runs out until half an hour before high-water by the shore; and in, until half an hour before low-water; but strong winds cause great irregularities. It will be observed, therefore, that the stream ran out nearly all the time the water was rising; and in nearly all the time it was falling.

The rise of the tide diminishes rapidly as we proceed into the Bras Dor, and beyond the strait of Barra becomes nearly or altogether insensible.

There are houses and farms on either side of the entrance of the Great Bras Dor, at which supplies of fresh provisions may be obtained; water is easily procured.

THE GREAT BRAS DOR, separating the coal-bearing strata of Boulardrie Island and the country further to the S.E. from the older rocks, forms the boundary of a great change in the character of the coast. Instead of mountains we have now a coast of moderate elevation, characterized by cliffs of sandstone, and shale of the coal formation, until we arrive at older rocks on the South shore of Mira Bay, and at *Boulardrie Island.*

Scatari Island; the latter being distant from the Great Bras Dor 36 miles. The dangers of this coast are such as to render great caution necessary at night or in fogs, when 30 fathoms, or at least 20 fathoms, is as near as a stranger should approach; the latter depth being in some parts within 2 miles of the shore.

Little Bras Dor Pass. THE LITTLE BRAS DOR is the narrow and winding passage on the Eastern side of Boulardrie Island; which, at the distance of 5 miles from its entrance, expands into the wide and deep channel of St. Andrew.

It can only be entered by small craft and boats under favorable circumstances, the entrance being closed with breakers when there is a heavy sea running, and especially when the strong tide is running out against the wind. The depth at low-water, over the rocky bar, is 7 feet, in a channel between reefs, and only 25 fathoms wide.

Tides. It is high-water, full and change, at 7¾ hours; and the rise in ordinary spring and neap tides is 3 and 2 feet respectively. The usual rate of the stream in the entrance is 4 knots. There is a fishing establishment on the shingle point just within the entrance, and scattered houses and farms on either side. The approach to the Little Bras Dor is rendered dangerous to strangers by the shoals on the East side of Cunet Point, extending 600 fathoms off shore; and by the reefs off Alder Point and Mope Head to the East of the entrance.

Bird and Bonar Rocks. THE BIRD ROCK, 6 feet high, will be seen on the reef 400 fathoms S.E. from Mope Head; and the Bonar Rocks, dry at low-water, at the same distance off Bonar Head. In addition to these dangers, observe that in the distance of 6 miles from Cunet Point to Cranberry Head, the shoal water for a large ship frequently extends to nearly a mile off shore.

Sydney Harbor. SYDNEY HARBOR* is one of the finest ports in the world, being equally easy of access and egress, and capable of containing any number of the largest vessels in perfect safety. It is 3 miles wide at the outer entrance; but the navigable channel contracts rapidly to the breadth of half a mile between the two bars; which are of sand and shingle, and extend from the shore on either side, at 5 miles within the light-house on Flat Point. Inside these bars the harbor divides into the West and South Arms; the former being open to the E.N.E. winds, except at the coal-loading ground, where the vessels anchor under shelter of the N.W. Bar; and at North Sydney, where they may lie in like manner under Allen Point. The South Arm, being completely sheltered from the sea by the S.E. Bar, affords safe anchorage in every part. The Town of Sydney, 3½ miles up this arm, is exceedingly well situated on the West side and summit of a peninsula, 55 feet high.

It has deep water close to its wharfs, and the arm continues navigable for vessels to Sydney Bridge, a distance of 2 miles; and for boats to the Fork's Bridge, where the tide ends 6 miles above the town, and from which a road leads across to the East Bay of the Bras Dor.

Sydney Light. The light-house on Flat Point is octagonal in shape, painted red and white, vertically, and shows a fixed light 70 feet above the sea. Leaving this on the left, on entering the harbor, the high and conspicuous colliery chimneys, the Episcopal, Scotch, and Roman Catholic churches, together with the other buildings at the mines, will be seen on the opposite shore, at the distance of 1½ mile within the cliffs of Cranberry Head: as will also the Sailors' and Roman Catholic churches, with the stores, houses, and wharfs at the loading ground, which is 2 miles further in along the same side of the harbor.

Approach to Sydney Harbor. Vessels bound to this harbor should observe the following directions:—

First. When approaching from the Northward with a leading wind, steer so as to pass the reef off Cranberry Head (on which lies Cran Rock, with 16 feet water, half a mile off shore) in 10 fathoms; and when the high cliff of Mine Point opens out to the Eastward of Swivel Point, haul into the harbor. If bound to the loading ground, run along the N.W. shore, in not less than 5 fathoms, until past Mine Point, then steer off to the Southward, sufficiently to bring Jackson and Allen Points (two shingle points, up the West Arm) in one; or until the light-house comes in one with Petre Point; either of which, or at night the depth of 6¾ fathoms, will lead clear of the N.W. bar, which is very steep, having 5½ fathoms close to it.

Coal-Loading Ground.

N.W. Bar.

When the wharfs at the loading ground bear N.W., the vessel will be well within the bar; and may haul in and choose her berth in 5 or 6 fathoms, mud bottom, and at the distance of 150 or 200 fathoms from the wharfs.

South Arm. If the vessel be bound up the South Arm, run in as before, or in mid-channel, until the Easternmost of the high colliery chimneys appears to the Westward of the Episcopal church, which is the Easternmost church on Mine Point; then run from those marks, keeping the Easternmost chimney a little open to the Westward of the church, and they will lead clear of the S.E. bar; the Western extremity of which will be passed, when the West point of its shingle beach begins to bear to the Northward of East.

* See Plan.

The vessel may then either haul to the Eastward, and anchor in Fishery Cove, in 6 or 7 fathoms, mud bottom, or proceed on to the town of Sydney. In the latter case, it will only be necessary to consult the chart for the extent of the shallow water off either shore; not failing to observe that the reef off Battery Point extends a quarter of a mile out N. by E. The anchorage is good anywhere off the wharfs of the town, if outside a line joining the English church and Shingle Point; within that line there being shoals, as will be seen in the chart. The depth at this anchorage is from 5 to 8½ fathoms, with mud bottom; and there is sufficient depth of water for large vessels all the way to the bridge, between which and the town is the most secure part of the harbor. *Fishery Cove.*

Secondly. When approaching from the Eastward, pass the light-house no nearer than half a mile, or in not less than 7 fathoms; and to avoid Petre Reef (dry at low-water, a mile within the light-house) do not haul into the harbor until Daly Point opens out to the Northward of Gillivray Point: and to clear the shoal at Petre Point, and further in, do not approach nearer than half a mile, or than 5½ fathoms, as you run along the Eastern shore. When the light-house and Petre Point come in one, keep them so as you run from them, and they will lead to the loading ground as before. If bound up the South Arm or to Sydney, run with the light-house and Petre Point in one, or with the former only just shut in, until the marks for clearing the S.E. bar, namely, the Eastern colliery chimney and the Episcopal church on Mine Point become in one, when proceed as before directed.

In beating into this harbor, great care must be used, especially when between the N.W. and S.E. bars, both of which are so steep that the lead will afford little or no warning. *Turning in.*

There is, however, plenty of room; and, with the aid of the Admiralty chart, the intelligent seaman will experience no difficulty even in the largest ship.

It is high-water at the S.E. bar, and also at the town of Sydney, on the full and change days, at 8¼ hours after the moon's transit, the rise at ordinary spring and neap tides being, at the bar, 3¾ feet and 2½ feet respectively; and at the town, 5 and 4 feet. The ordinary rate of the streams is half a knot off the town, but much weaker further out into the wider parts of the harbor. *Tides.*

The most convenient watering-place is at the creek, which discharges the waters of the Sawmill Lake, a short distance to the Westward of the loading ground; but good water may be obtained on the East side of the South Arm, also opposite the town, and in several other places where brooks enter the sea. The country is well settled around the harbor, and supplies of every kind may be readily obtained.

INDIAN BAY, 5 miles S.E. from Sydney light-house, is open to the wind and swell from the Eastward, and therefore affords a safe anchorage only in off-shore winds and fine weather. *Indian Bay.*

It is 3 miles wide by 1½ mile deep: at its head a dry sand-bar, a mile long, extends across from the Southern to within 75 fathoms of the Northern shore; leaving an entrance of that breadth into Bridgeport Harbor, a shallow pond, extending 2 miles inland. The depth of 8 feet at low-water is all that can be carried into this harbor, the interior of which is occupied by flats of sand and weeds, partly dry at low-water; except in a narrow and winding channel from 7 to 15 feet deep, and which leads into a wide expansion 8 feet deep at low-water. *Bridgeport Harbor.*

In approaching this bay, in order to anchor, give its points, which are cliffs of the coal formation, a berth of full half a mile, or pass them in not less than 5 fathoms; and observe that shallow water extends to the same distance from the North shore and head of the bay, as well as further Eastward towards Table Head.

The best anchorage is near the middle of the bay, and within the depth of 5 fathoms; in greater depths the bottom is in general rocky, and not to be trusted.

It is high-water in the entrance of the harbor, on the full and change days, at 8 hours; and the rise is from 3¾ feet to 2½ feet, accordingly as it may be spring or neap tides. The ordinary rate of the stream in the entrance is 2 knots. *Tides.*

GLACE BAY, 5 miles further to the S.E., affords no safe anchorage. At its head is Dyson Pond, extending 2 miles inland, and having a narrow outlet, through sand-hills and sand-beach, which is usually dry at low-water. On the N.W. side of this bay, at Glace Cove, the shallow water extends three-quarters of a mile off shore; and on the opposite side a tMacrea and Dyson Points, the reefs run out fully half a mile from the cliffs. *Glace Bay.*

Proceeding 4 miles further to the Eastward we arrive at Cape Percy, a precipitous headland, where the cliffs of coal-bearing sandstone rise to 110 feet above the sea. Off its North side lies Schooner Rock, with 5 feet least water, being the shallowest part of a reef which extends 400 fathoms out from the shore. Percy Rock, with 7 feet least water, lies 200 fathoms off the North-east shoulder of the cape. Flint Island, and, on which there is a revolving light, is of sandstone, broken by the waves, precipitous, 60 feet high, and 300 fathoms long, in an E. by N. direction. On its North *Cape Percy. Schooner Rock. Percy Rock. Flint Island. Revolving Light.*

point there is a fish-store where alone boats can land. It lies 1600 fathoms E. by S. from Cape Percy. Shallow water extends only a third of a mile from it in any direction; but off its West end, to the distance of 400 fathoms, there are very irregular soundings, 4½ to 12 fathoms in a cast of the lead; which cause, with the tide, a strong rippling, and at times a heavy breaking sea.

Between these dangers and the Cape there is a clear channel a mile in breadth, through which an irregular tidal-stream runs at times 2 knots.

At Cape Percy the direction of the coast changes from S.E. to S.S.W., and continues in the latter direction for about 14 miles, across the mouths of Morien and Mira Bays, to Cape Breton, the Eastern extremity of Breton Island.

Morien Bay. MORIEN BAY is 2½ miles wide at its entrance, between Capes Percy and Morien.

Cow Reef. On its North side, just within Cape Percy, lies Cow Reef, dry in part at low-water, and extending to half a mile from the shore. The head of the bay is occupied by flats of sand and mud, partly dry at low-water, and through which a narrow shallow channel leads to False Bay Beach, on the North side of Mira Bay. Being completely open to Easterly winds, Morien Bay affords no safe anchorage.

Cape Morien CAPE MORIEN is a bold headland, the shoal water extending only 150 fathoms from its sandstone cliffs; which abound in coal, and rise, on its South side, 150 feet above the sea. It is the N.E. extremity of a peninsula, which forms the precipitous North shore of Mira Bay, for a distance of 5 miles, and terminates at the shingle isthmus of False Bay Beach, already mentioned.

Mira Bay. MIRA BAY is also open to winds from the Eastward, and affords no safe anchorage. It is of great extent, stretching in 9 miles to the Westward of Cape Morien; and being 7¼ miles wide at the entrance between that cape and Moque Head. Mira River, after flowing for several miles between precipitous banks, enters the head of the bay between points of sand and shingle, 40 fathoms apart. It discharges the waters

Mira Lake. of Mira Lake and Salmon River, and is the outlet of an interior navigation of about 20 miles: but the ordinary depth on its bar of sand and stones is only 4 feet at low-water, and seldom exceeds 8 feet, except in extraordinary spring-tides.

Catalogne Lake. CATALOGNE LAKE has only one foot at low-water in its very narrow outlet, through a sand and shingle beach, 2 miles South of Mira River. It is broken into coves, peninsulas, and islets, forming picturesque scenery. There is a Presbyterian church at its head, three miles in from the entrance, and its shores are occupied by farmers and fishermen.

Menadou Harbor. MENADOU HARBOR, on the North side of Menadou Bay, three-quarters of a mile within Moque Head, is a semicircular cove, a quarter of a mile wide. Its shingle beach is occupied by fish-stages, and its shores by a busy village of fishermen and small traders. It has a Roman Catholic and English Episcopal chapel, the former only being distinguished by a steeple; and the population, including those scattered around the bay, amounts to about 300 souls. The depth at low-water in this small harbor is from 10 to 14 feet, over sandy bottom. It is sufficiently sheltered by the numerous rocks in the bay, and by the Island of Scatari, to afford safe anchorage to fishing schooners and coasting vessels, drawing less than 10 feet water: but larger vessels would be endangered by the swell or *under-tow* that accompanies a gale from the Eastward, and which would cause them to strike the ground at low-water. The approach to this harbor, between numerous rocks above and under water, is so difficult and dangerous, that no written directions could avail; the plan of the bay on a large scale, or the assistance of a fisherman of the place, would be indispensable to any stranger.

Tides. It is high-water at Menadou, on the full and change days, at 8¼ hours; the rise in ordinary spring-tides is 5½ feet, and in neap tides 3½ feet.

Menadou Passage. THE MENADOU PASSAGE is a mile wide between Moque Head and the West point of Scatari Island, and has a clear deep-water channel of nearly half that breadth, in the narrowest part, which is between the Great and Little Shag Rocks in the Northern part of the entrance. Nevertheless, it should only be used in cases of emergency, or in such circumstances of wind and weather as would insure the not being surprised by the prevailing dense fog, in a channel rendered indirect by numerous dangers, destitute of good holding-ground, and in which there is no shelter from the heavy sea that accompanies all Easterly and Southerly winds. The principal dangers of this passage are the Shag Rock and Bar Reef, the other rocks in the mouth of Menadou Bay being less in the way of vessels.

Shag Rock. THE SHAG ROCK is black, 30 fathoms long and 15 feet high; it will, therefore, readily be seen; but a rocky shoal extends from it 400 fathoms E.N.E., and 180 fathoms E.S.E. In this latter direction there is a patch with 12 feet least water on the ex-

Little Shag. treme edge of the shoal. The Little Shag and the Cary Rocks, half a mile to the

Cary Rocks. Eastward of it and 70 fathoms off shore, can also be seen, being small black trap rocks, respectively 6 and 4 feet above high-water. The Little Shag lies 150 fathoms North from the West Point of Scatari, and the shoal water outside of it does not

extend beyond the distance of 50 fathoms; leaving a clear channel 450 fathoms wide, and 9 fathoms deep, between it and the Shag Shoal.

This is the main channel, that to the West of the Shag being rendered dangerous by Neering Rock, which, with 9 feet least water, lies 350 fathoms N.W. from the Shag Rock; also by Duck Rock awash at high-water, and lying 175 fathoms South from Moque Head; and by Mad Dick, which, with 3 feet least water, lies 200 fathoms further to S.W. To these dangers, on the W. side of the channel, we may add the Black Rock, which can always be seen, and the other rocks in the mouth of Menadou Bay, but they are out of the way of passing vessels. There remains the Bar Reef, which runs out from Bar Point, to the Southward of Menadou Bay, and more than half-way across to the Island of Scatari. It was formerly a dry bar, covered with sand and grass; at present the only part uncovered at high-water is the Bar Stone, a single mass of rock, about 4 feet high; but at low-water the reef still dries extensively, and completely shelters Menadou from the South wind and swell. The Bar Stone lies three-quarters of a mile off shore, and the reef continues a quarter of a mile further out, towards the West point of Scatari, which it approaches to within three-quarters of a mile, and then turns to the S.E. *Neering Rock. Duck Rock. Mad Dick. Black Rock. Bar Reef. Bar Stone.*

In this last-named direction, the reef continues three-quarters of a mile, and terminates at the Helen Rocks, in only 4 and 6 feet at low-water, on which the sea often breaks heavily. The Eastern extremity of this dangerous reef, in 5 fathoms, bears S. by W., 1½ mile from the West Point of Scatari; and N.N.E., 2 miles, from Cape Breton. A line from one of those points to the other passes over the East end of the reef in 6 feet at low-water; and vessels will clear it to the Eastward, if Portnova Island be not entirely shut in behind Cape Breton. *Helen Rocks.*

CAPE BRETON, the extreme Eastern Point of Breton Island, is low, rocky, and covered with grassy moors. It is bold to the Eastward, with the exception of a rocky 12 feet patch bearing S.S.E. ½ E., a quarter of a mile. On the North side of the Cape, three-quarters of a mile, lies Lansecoin Island,* in the mouth of a shallow bay. This island, which is about 2 cables' length in diameter, and 50 feet high, is bold to seaward; but there is a rock dry at low-water between it and the cape. *Cape Breton. Lansecoin Island.*

PORTNOVA ISLAND† lies off the South side of the cape, from which it bears S.S.W. ½ W., three-quarters of a mile. It is rocky and precipitous, 150 fathoms in diameter, and 50 feet high. It is bold to seaward, but Chameau Rock, which is awash, and on which a French frigate was lost, lies nearly midway between it and the cape, leaving no passage for ships. *Portnova Island. Chameau Rock.*

On the opposite side of the passage, the reefs off the S.W. side of Scatari can always be seen, and do not extend more than 2 cables' length off shore. We need only mention here the Hatch Rocks and Ragged Rocks; the former being most in the way, will be cleared, as long as Shag Rock is not shut in behind the West Point. *Hatch and Ragged Rocks.*

MENADOU PASSAGE has hitherto been considered too dangerous for any but fishing and coasting vessels; but with the aid of the Admiralty chart, and the description and directions here given, the largest ship may take it without danger, in case of need, and under favorable circumstances of wind and weather. All Southerly and Easterly winds are unfavorable, because either accompanied by or liable to the sudden arrival of dense fogs. Winds from between the West and North are as constantly free from fogs, and being, moreover, smooth-water winds, are favorable for this passage. *Menadou Passage,*

In a vessel approaching from the Southward, with a Westerly wind, and wishing to avoid running to leeward to pass outside of Scatari, proceed as follows:—Pass Portnova Island and Cape Breton at the distance of half a mile or more, steering for a remarkable hill called Steering Hummock, which stands 600 fathoms to the Eastward of the West Point of Scatari. Take care not to shut in Portnova Island behind Cape Breton, until sure that Bar Reef has been passed; and when the West Point of Scatari bears a point or more to the Westward of North, steer so as to pass round it at a distance between a quarter and half a mile; keeping gradually away to the Northward and Eastward, so as to pass between the Little Shag Rock and Shag Shoal. When the Shag Rock comes in one with West Point, or when the latter bears to the Westward of South, the Shag Shoal will be past, and the vessel may be steered for Cape Morien. *from the Southward,*

If coming from the Northward, with a fair wind, bring the West point of Scatari to bear to the Westward of South, and steer for it until the Eastern extremity of Shag Shoal is past, which will be when the Shag Rock and Moque Head come in one: then change course so as to pass the Little Shag and West Point at the distance of 200 or 300 fathoms; which having done, steer out S.E. by S.; remembering the marks for clearing the Hatch Rocks and the East end of Bar Reef. *and from the Northward.*

* From L'Anse au Coin.
† From Puerto Nuevo, a very inapplicable name, there being no port near.

Tides. The ordinary rate of the tidal-streams in Menadou Passage is from 1 to 2 knots, the flood from the Southward, and the ebb in the opposite direction; but they are often very irregular.

Scatari Island. SCATARI ISLAND, forming the extreme Eastern dependency of Breton Island, is in shape a triangle; the longest side of which faces the North, and extends 5½ miles; while a line at right angles to it, and terminating at Howe Point, the Southern extremity of the island, gives an extreme breadth of 2½ miles.

The natural features of this island are similar to those of the adjacent main-land, the highest hill rising 190 feet above the sea. It is not permanently inhabited, being reserved by the colonial government, but is much frequented by the fishermen in the summer season. *N.W. Cove.* Near the centre of its Northern shore is the N.W. Cove, affording a smooth-water anchorage in Southerly winds; but the holding-ground is not good, and vessels should be prepared to weigh promptly with the change of wind. The S.W. and S.E. sides of the island are broken, by the heavy and almost incessant Atlantic swell, into rocky points and coves, which afford excellent fishing-stations, but no shelter to shipping.

Eastern Harbor. Eastern Harbor, formed by Hay Island on the South side of the East point, does not deserve the name, being merely a very insecure anchorage within the reefs; but it is used occasionally in fine summer weather by small vessels employed in the fisheries, and in saving things from wrecks.

Scatari Light. THE LIGHT-HOUSE, on the East point of Scatari, is octagonal in shape, painted white, and 70 feet high. It stands on Trap Rock, 90 feet above the sea, and shows a Revolving Light, visible a minute and eclipsed for half a minute. It is furnished with a gun for signals, and a boat to assist vessels in distress.

The reefs off the S.W. side of the island have been already mentioned, as extending only 2 cables' length off shore; those off the North side are still shorter. The principal dangers are on the S.E. side, where a reef runs out half a mile from Hay Island. *Hay Island Reef.* Outside of this, and bearing South 1⅛ mile from the light-house, lies Wattie Rock, with 24 feet at low-water; and still further out, and bearing S. ½ E., 1½ mile from the light, there are two rocky patches, with 5 fathoms, on which the sea occasionally breaks. *Wattie Rock.*

Cormandiere Rocks. THE CORMANDIERE ROCKS lie nearly three-quarters of a mile off the light to the Eastward. They are small black trap rocks, from 6 to 16 feet high, and can therefore always be seen. They are bold to seaward, and there is no passage between them and the light for ships.

Scatari, like St. Paul Island, has become celebrated for many fatal shipwrecks; but these casualties, which have been mainly occasioned by the neglect of the lead, in vessels bound for the Gulf of St. Lawrence, and meeting the prevailing current on the starboard bow, have been greatly diminished since the establishment of the light, in 1839.

BRETON ISLAND, SOUTH COAST.

Louisbourg Harbor. 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. *Light-house.* On the East Head, and on the site of the old French light-house, a light-house, 15 feet high, showing a fixed light, has been erected; it is painted white, with a perpendicular black stripe on each side. 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 port side, going in, is the boldest.

Gabarus Bay. GABARUS BAY.—From the entrance of Louisbourg to Guion Island, 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 land-locked. And 5 miles South-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.

Blancherotte, or White Cliff. 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 2 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 Arichat.

In the description of the Gut of Canso, already given, 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.

THE SOUTHERN COAST OF NOVA SCOTIA.

CAPE CANSO TO CAPE SABLE.

Description of the Land.—The Eastern part of Nova Scotia is broken into the several islands and passages as represented on the charts.

Dover Bay.

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.

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.

WHITE HAVEN, which is 2 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.

Light.

On the S.W. point of the island there is a revolving flashing light: flash of 10 seconds; eclipse of 10 seconds; the tower is white; the lantern is 55 feet above high-water.

Torbay.

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 Eastern 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.

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.

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's Harbor and Harbor Point the ground is foul and rocky.

Country Harbor.

COUNTRY HARBOR.—The fine harbor, called Country Harbor, is navigable for the largest ships, 12 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 island affords 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.

High-water.

Fisherman's Harbor.

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.

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.

BICKERTON HARBOR, to the West of Fisherman's Harbor, is fit for small vessels only. At 2 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.

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. *Wedge Isle.*

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. *Jegogan Harbor.*

LISCOMB HARBOR.—The entrance of this harbor, which is one of the best on the coast, is between Liscomb Island and the headland 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. *Liscomb Harbor.*

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. *Tides.*

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. *Bay of Islands.*

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 within them, in from 10 to 7 fathoms. From these the rocks and ledges extend 5 or 6 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. *Beaver Harbor.*

LIGHT.—On the Outer Beach, or Williams Island, there is a light-house 70 feet high, showing a revolving light, visible 1½ minute, obscured half a minute. *Light-house.*

The lantern is on a square building, with two black balls painted on the seaward side.

A reef extends from the East end of Beaver Island a considerable distance, so that on entering the bay you should give the light a berth of three-quarters of a mile.

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. *Sheet Harbor.*

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 turning up the harbor, give the sides a very moderate berth, and you will have from 11 to 5 fathoms, good holding-ground.

Tides. 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. 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 cleared by keeping the Sheet Rock open of the island.

Spry Harbor. 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. The tide at the entrance of Spry Harbor sets in with the velocity of about one mile an hour.

Pope Harbor. POPE HARBOR has a depth of water sufficient for large ships, but it is only secure within Harbor Island, where the deep water being little more than a cable in width, it would be necessary to moor. In the bay outside, a heavy swell rolls in during Southerly gales.

Dangers at Entrance. DANGERS AT ENTRANCE.—Of the formidable dangers off this harbor, the Horse Rock, with only 4 feet water on it, lies the furthest out, bearing from Pope Rock, in line with the East end of Iron-bound Island, S.S.E. ¾ E., 1½ mile. The Pope Shoals, which are exceedingly dangerous, extend more than half-way out from Pope Rock towards the Horse Rock, and the soundings are rocky and irregular in the remaining distance. Pope Rock is above water, and distant three-quarters of a mile from Iron-bound Island, but the passage between them is rendered impassable to strangers by sunken rocks, including Drunken Dick, Soup Rock, &c.; and so also is the passage between the island and the main. All these dangers are to be left to the Westward in running in, and so also must Schooner Rock, which has only a fathom on it, and which lies a quarter of a mile out from the islets at the entrance of Shelter Cove, in which the fishing schooners lie land-locked in 2 or 3 fathoms at low-water. From Black Rock, which lies a third of a mile further in on the same or Western side, and is always above water, the shallow water does not extend beyond a cable's length to the Eastward; leaving a clear channel between it and the Barrier Reef a quarter of a mile wide.

A reference to the Admiralty chart will show that the dangers on the Eastern side are few, and easily avoided: that the Western side of Phœnix Island is quite bold, and the channel between it and the Pope Shoals is a third of a mile wide, and twelve fathoms deep. Also, that some part of the reef off Gerard Head, and of the Barrier Reef can always be seen, and that the shallow water does not extend from the dry parts more than a cable's length. Lastly, observe that the steeple of the Episcopal church, which stands more than 100 feet up on the grassy hill in rear of Bollong Point, can be seen from distances of many miles out at sea; and that the Roman Catholic chapel stands low down near the water on the Western side of the point, and had a cross upon it, but no steeple at the time of this survey.

Directions DIRECTIONS.—In a vessel bound to Pope Harbor with a fair wind, refer to the chart and proceed as follows:—When not less than two and a half miles from the outer islands, bring the Episcopal church steeple in line with Gerard Head, bearing N. by W. ¾ W., and it will lead in between Phœnix Island and the Pope Shoals. As soon as Pope Head and Taylor Head come in one, bearing E. ½ S., alter course to N.W. by N., which will lead midway between the reef off Gerard Head and Schooner Rock; and when the two Western points of Harbor Island come in one, bearing N. by W. ½ W., (when they should also be in line with the Roman Catholic chapel, which is not easily distinguished,) alter course to N.N.W. ½ W., (for the head of the harbor,

so as to pass midway between Harbor Island and Grum Point,) until the channel through the harbor and to the Northward of Gerard Island begins to open; then keep away to the N.E. by N., or for the Episcopal church, until the points of Long Island on the Northern side of the harbor come in one, bearing E. ¾ N., when run in with those marks on, and anchor midway between Bollong Point and the Northeast point of Harbor Island, in 4½ fathoms, over mud. Should the wind be from the Eastward, the vessel may anchor outside on the last-named leading-marks, and in 6¾ fathoms muddy bottom, and may either wait for a fair wind or warp into the harbor. Small craft can pass from this harbor Eastward through the narrow channel between Long and Gerard Islands, into a far more capacious and land-locked anchorage, but which is accessible to large vessels only from Spry Bay, through very narrow and intricate channels on either side of a shoal, between Dutchtown Point and Gerard Island.

TIDES.—It is high-water in Pope Harbor, full and change, at 7h. 40m. P. M., rise at springs 6½ feet; at neaps 4½ feet; but strong winds cause great irregularities. The tidal-streams are weak and irregular. *Tides.*

TANGIER HARBOR communicates with Shoal Bay by a very narrow and intricate channel, between the inner Baltee Island and the main-land; and there is also a wider passage between Baltee and Tangier Islands, but it is full of rocks. *Tangier Harbor.*

This harbor is too shallow and too full of rocks for large ships, but it affords a secure anchorage for small vessels near its head, especially in Mason Cove, which is on the Eastern side, and 2½ miles from the entrance.

DIRECTIONS.—In approaching the harbor, Porcupine Hill should be kept well open to the Westward of Iron-bound Island, to clear the Pope Shoals; and, on the other hand, Porcupine Point should be hidden behind Sandy Cove Point, to clear the shallow water off Tangier Island. These marks, however, might not be easily recognized by a stranger, who might safely do without them by proceeding as follows: *Directions.*

In running for the anchorage, avoid the ledges off Iron-bound Island, by bringing Sandy Cove Point to bear N.N.W., or pass the Eastern point of Tangier Island at a distance of between 1½ and 3½ cables' length, or midway between it and Drunken Dick, which is almost always shown by a breaker. Having passed Sandy Cove and Porcupine Points at a distance of between 1½ and 2½ cables, and midway between the Whaleback and Shag ledges (which are dry at low water) and the Eastern shore, haul round the Western point of Hog Island, and anchor within it in Mason Cove, where the vessel will lie land-locked in 15 or 16 feet at low-water, and over a bottom of stiff mud. There are rocks, with only 16 and 17 feet over them at low-water, so scattered about this harbor, that no written directions would enable a stranger to avoid them; therefore, vessels of too great draught to pass over them in safety should not attempt to run in.

Around the head of the harbor, and also on the point of the main-land that separates it from Pope Harbor, there are tracts of tolerably good pasture land, from which, together with the fishing and coasting trades, the inhabitants derive a comfortable subsistence.

SHOAL BAY is sufficiently wide for large ships to beat in and out with ease. The coasting schooners anchor off Shellnut Cove in 3 or 3½ fathoms, mud, with the small Mary Island in one with Borgle Bluff (the North-east extremity of Charles Island) bearing S. by E.; but the only secure anchorage for large ships is on the opposite or South-western side, near the head of the bay, where the Middle-ground, with only 12 feet water on it, and which bears from the North point of Charles Island N.W. ¾ N. 5½ cables' length, and from Moose Island N.E. by E. ¾ E. 3 cables' length, is the only danger much in the way. *Shoal Bay.*

ANCHORAGE.—Vessels should anchor with Borgle Bluff and Outer Island touching, and bearing S.E. ½ E.; either midway between the Middle-ground and the North point of Charles Island, in 5½ fathoms, over sand, when Round Islet should be in one with Tucker Point, bearing S.S.W. ¼ W., 2 cables' length; or else to the North-west of the Middle-ground, in 4½ fathoms, over mud, with Hardwood Island seen through the Tickle, and bearing W.S.W.; the latter being much the preferable berth. *Anchorage.*

DIRECTIONS.—In running for this anchorage, the dangers on the Western side of the bay, namely, the ledges off Charles Point and also Borgle Shoal, which has 16 feet water on it, may be avoided by keeping the remarkable and highest red clay cliff at the head of the bay open of Borgle Bluff, bearing nothing to the Northward of N.N.W. On the Eastern side, round Outer Island, at the distance of half a mile or more, to avoid the reefs off it, and pass to the Westward of Baltee Shoal, (on which, however, there are not less than 4 fathoms,) by bringing Borgle Bluff to bear to the Northward of N.W. ½ N. as you run up the bay. Leave Net Shoal, which has 18 feet water on it, to the Eastward, by keeping the Western extremity of the remarkable and highest red clay cliff, already mentioned, open to the Westward of Mary Island, bearing nothing to the Westward of N.W. by N. The same marks lead close to the S.W. of Eve Ledge, the only other danger in the way, which is awash at high-water, and there- *Directions.*

fore always visible. It is bold on the S.W. side, and having passed between it and the North point of Charles Island, (where the channel is clear, and nearly half a mile wide,) avoid the Middle-ground, as you pass between it and Mary Island, by not bringing Borgle Bluff to bear to the Eastward of S.E. by S. until the South sides of Mary and Tuff Islands come in one, bearing E. ¼ N., or until Hardwood Island appears through the Tickle; then keep away to the Westward, and anchor on the line of Borgle Bluff and Outer Island touching, and bearing S.E. ½ E., with the whole of Hardwood Island seen through the Tickle, bearing W.S.W., and in 4½ fathoms, over mud, as already pointed out. This anchorage is perfectly safe, although some swells may roll in during or after heavy South-east gales. The head of the bay is well settled, the hills of red clay affording a productive soil, but the islands are almost everywhere barren. Supplies of fresh provisions, wood, and water may be obtained.

Ship Harbor. SHIP HARBOR is absurdly called Charles River in the old charts and directions, whilst the channel which leads to it between the islands is termed the harbor, although it is completely open to a Southerly wind and swell, and affords no secure anchorage for ships, excepting in Day Cove, which is within Passage Island, and in the mouth of the shallow passage leading Westward into Owl's Head Bay; and even there a vessel must lie in less than 4 fathoms, to be entirely out of the swell that rolls in after heavy Southerly gales. On the Eastern side, Deep Cove in Charles Island, and the narrow passages leading to Shoal Bay, are full of rocks, and therefore too dangerous for general use. Nichol and Charles Islands are among the largest on this coast; they are barren, of gneiss, and nowhere more than 100 feet above the sea.

Danger at Entrance. DANGER AT ENTRANCE.—The entrance of Ship Harbor, although very narrow, is not difficult with a fair wind, and within it any number of the largest ships may be moored in perfect security; nevertheless, the interior of the harbor is far from being free from shoals, as misrepresented in the old charts. In approaching the harbor, the principal dangers lie outside the islands off its entrance. Friar Island and Friar Ledges lie on the Western side, and off them Flat Ledge, always above water, and from which the West Bull Rock, with only a fathom water on it, bears W. by S. ½ S., a quarter of a mile, and the East Bull Rock, with 4 fathoms on it, East, 1¾ cables' length. Bald Rock and Egg Island in one, bearing W. ½ S., lead a third of a mile to the Southward of these dangers. There is also the Middle-ground with 2¾ feet on it, bearing from Flat Ledge E.N.E. 6 cables' length, and the more dangerous N.E. shoal, with only 15 feet water on it, bearing from the Eastern end of Friar Ledge N.E. by E., 4½ cables' length, and from Bear Rock W. by S. three-quarters of a mile. These dangers lie to the Southward of Nichol Island, and vessels in approaching the harbor should pass to the Southward and Eastward of them all. Further in, the rocks and shallow water off the Eastern side of Nichol Island, including Pot Rock, with 4 fathoms on it, will be avoided, if Wolf Point (the high North-eastern extremity of Nichol Island) be not brought to bear to the Northward of N.N.W.

Bear Rock. BEAR ROCK, which is small, and rises 4 feet above high-water, is quite bold on the Eastern side, but a reef, in great part dry at low-water, extends from it 1½ cables' length to the Westward. It lies nearly in the middle of the entrance between the islands, with a clear channel on either side, about 4½ cables broad.

On the Eastern side of the entrance the principal dangers are the ledges off Charles Island, the outermost being the Bull Rock, with only 4 feet on it at low-water, and which is often shown by a breaker. It bears from Charles Point (the South extremity of Charles Island) S.E. ½ S., 6 cables' length, and, together with the numerous other rocks above and under water, will be cleared to the Southward if Long Point (the Southern extremity of Nichol Island) be kept open to the Southward of Bear Rock, bearing not less than half a point to the Northward of West. The mark that leads clear to the Westward of these dangers, including the ledges further in off Western Islands, is Passage Island, just hidden behind Wolf Point, bearing N.W. ½ W., and Ship Rock seen over Bald Island, and in one with Tucker Point bearing N. by W. ¾ W. There are also several outlying dangers, which are equally in the way of vessels running along the coast, or approaching this harbor. These are, Little Rock, bearing from Flat Ledge S.S.E. about 2 miles; Broad Shoal, from Charles Point S. by E. Easterly 1½ mile; Silver Shoal, from Charles Point S.E. ¾ S. 3¾ miles, and from the South-east point of Outer Island nearly South 2¾ miles. The least water on the two first is 4 fathoms, and on the last 5 fathoms. The sea breaks occasionally over them after heavy gales.

Directions from Westward. DIRECTIONS FROM THE WESTWARD.—In approaching Ship Harbor, Ship Rock (which gives its name to the harbor) may be recognized, being a remarkable cliff of clay slate, 70 feet high, on one of the islands on the Eastern side of the passage, and a mile within Charles Island. It appears, when seen from a distance out at sea, like a vessel under sail; and, together with the Western extremities of Bald Island and Tucker Point, forms the leading-marks for running in on either side of Bear Rock.

When running in with the wind from the Westward, proceed as follows :—To clear the East and West Bulls, run to the Eastward with Bald Rock and Egg Island in one; or pass outside of Flat Ledge, which can always be seen, at the distance of a third of a mile or more; and when Ship Rock comes in one with the Western point of Bald Island, bearing N. ¾ W., steer for them, and they will lead in between the N.E. shoal and the reef off Bear Rock. Having passed the latter, steer so as to pass midway between Wolf Point and Bald Island (from either of which the shallow water does not extend beyond 60 fathoms), and thence for the harbor's mouth. When abreast of Passage Island, haul to the Westward towards Day Cove, until the house on Eisan Point is in one with the North-east point of Caroline Island, and seen over the small shingle islet off Salmon Point, and nearly touching the clay cliff of the latter, bearing N.N.W. ½ W. Keep these marks exactly on, and they will lead in past Black Rock (which lies outside Black Point on the Eastern side of the entrance) and O'Brien Reef, which lies half a mile further in, and also on the Eastern side of the narrow channel. Having passed between O'Brien Reef and Beach Point of shingle, (where the channel is only 70 fathoms wide, between the 3 fathoms line, and 11 fathoms deep,) haul in more to the Westward, and anchor midway between Salmon Point and the Western shore, where the depth is 7 fathoms, or anywhere between Salmon Point and Whale Island in 4, 5 or 6 fathoms; the bottom being of mud, and the shelter complete. Caroline Island lies over on the Western side of the harbor, a mile within Beach Point, and will be easily recognized by a round wooded hill, 190 feet high, near its North-east point.

From the Eastward.

FROM THE EASTWARD.—Approaching the harbor from the Eastward with a fair wind, Bull Rock, and the other ledges off Charles Island, will be avoided by keeping Long Point open to the Southward of Bear Rock, and bearing to the Northward of W. ½ N., until Passage Island disappears behind Wolf Point, bearing N.W. ½ W.; then steer for Wolf Point, keeping Passage Island shut in until past the Western Islands; then, midway between Wolf Point and Bald Island, and thence for the harbor's mouth, as already directed.

If the wind should be unfavorable for running in, anchor outside in Day Cove, either midway between Passage Island and Day Point in 4½ fathoms, over mud; or further in to the Westward, in any depth from 4 to 2½ fathoms, according to the size of the vessel. In the first-named berth the Western Islands are just shut in behind the Eastern point of Passage Island, bearing S.E. by E., and the vessel will only be exposed to the swell rolling round the latter after a South-easterly gale; further in there is little or no swell.

With a beating wind the passage to the Eastward of Bear Rock is preferable for a stranger, for the rock is bold close to on the side, and the leading-marks will enable her to stand with confidence over towards the ledges off Charles Island, including the Western Islands.

An inspection of the chart will show that shoals commence immediately within Salmon Point on one side, and Whale Island on the other; and that the channel becomes exceedingly intricate after passing Caroline Island and the opposite Muscle Island, 2 miles within the entrance. If the very narrow channel between Garret Ledge and the White Rocks were buoyed, 21 feet at low-water could be carried through into the clear part of the harbor within Eisan Point, where the depth amounts to 9 fathoms, with space sufficient for a large fleet to lie in perfect safety.

Tides.

TIDES.—It is high-water, at full and change, at 7h. 59m. after the moon's transit; the ordinary rise in springs is 6¼ feet, and in neaps 4¾ feet; but winds cause great irregularities both in the times and rise; extraordinary springs rising 7 feet, and neaps only 4 feet.

The ordinary rate of the tidal-streams does not exceed half a knot; but after heavy rains, the melting of the winter's snow, or strong South-easterly gales, that have driven the water into the harbor, the ebbing stream is said to be much stronger.

Owl's Head Bay.

OWL'S HEAD BAY.—Owl's Head, which gives its name to the bay, has a remarkable round mound and cliff at its extremity, and is the most prominent point on the Western shore, 1¼ mile within the entrance. The bay lies 1½ mile to the Eastward of Bald Island, and is much frequented by coasting vessels, as an occasional stopping-place, on account of the facility with which they can beat in or out, the channel being nowhere less than half a mile wide. They anchor near the head of the bay, on either side, according to the wind; but to be well sheltered, they must lie in less than 3 fathoms at low-water. The statement in former directions, that "shipping lie land-locked in 6 or 7 fathoms," or in 5 fathoms, according to the old charts, being entirely erroneous.

The greatest danger to be avoided in entering this bay is Owl Rock, which lies over towards the Eastern side, with only 9 feet water on it, and which bears from the South point of Friar Island N.W. ½ W. three-quarters of a mile. The peninsula of Wisdom Point (at the head of the bay) and Cable Point touching and bearing N.N.W.,

lead clear to the Westward of it, and also of the reef which runs out 3½ cables' length to the South-west from Friar Island, and which can almost always be seen. On the Western side, the only dangers in the way are a rock, with only 10 feet water on it, 1½ cable's length North from Black Ledge; and the reef running out 1¾ cable's length from Cuckold Head. Further in the points are comparatively bold, and the bay free from hidden dangers. There are a few settlers at the head of the bay.

The False Passage. THE FALSE PASSAGE between Nichol and Cable Islands, on the Eastern side of the bay, is only fit for boats or very small craft, 4 feet being all that can be carried through at low-water.

Egg Island. EGG ISLAND bears from the South point of Long Island S.E. by E. 1⅔ mile, and is the outermost of the islands off this part of the coast. It is of rock, 1½ cable in length and 40 feet in height, and has been strongly recommended by Commander Shortland as the most eligible site for a light-house on this part of the coast.

Light-house.

Pyche and Grizzle Rocks. PYCHE AND GRIZZLE ROCKS.—Outside of Egg Island, at the distance of a quarter of a mile to the Southward, are the Transport Ledges, always above water; and the far more dangerous Pyche Rock, with only 18 feet water on it, and which bears from Egg Island, in line with Jedore Rock, E.S.E. ¼ E. three-quarters of a mile. Also the Grizzle Rock, with 4 fathoms on it, and which bears from Egg Island, in line with the North-east point of Long Island, N.W. ⅔ N., a little more than half a mile. The passage is clear between Egg Island and Flint Ledge, with the exception of Passage Rock, which has nearly 5 fathoms on it.

Between Flint Ledge (which is 10 feet above water) and Long Island, are the Tomfool Shoals, with 3 fathoms water on them, and within them Stoddart and Goose Ledges, lying off the entrances of Clamb and Little Harbors, which admit only small craft and boats; and for which, together with all in Clamb Bay, we again refer the seaman to the chart, in order to avoid extending these remarks to a useless or inconvenient length.

The Jedore Ledges. THE JEDORE LEDGES lie further off shore, and will require a more particular notice, including Macdonald and Hopkin Rocks, now for the first time laid down in any chart. The Macdonald, which has 14 feet water on it, bears from the South point of Long Island East, 1⅛ mile; and from it the East head of Jedore is seen over Spritsail Rock and the West point of Barren Island, bearing N.W. ½ N. Hopkin Rock has 11 feet on it, and from it the Old Man, with the breakers on Arnold Rock just open to the Southward of it, bears West 1⅔ mile; Mehanny Rocks, W.N.W. one mile; the East end of Spritsail Rock, North, one mile; and the South Sister Rocks, N.N.E., a long half mile. Both these rocks are very small, with deep water all around them, and break only in heavy weather.

South-West Ledges. THE SOUTH-WEST LEDGES, so named in reference to Long Island, are three rocky patches which dry at low-water, and cover a space of 3 cables' length in a S.W. ½ W. direction. From the North-easternmost ledge, the South point of Long Island bears N.N.E. ½ E., 1⅓ mile, and the passage is clear between them. The South-westernmost ledge is covered only during spring tides, and can, therefore, always be seen.

Bull Rock. THE BULL ROCK bears from the last-named ledge S.E. ¼ S., 6¼ cables' lengths distant, and is one of the most dangerous of the ledges, having only a depth of 5 feet over it at low-water, and at high-water it is only shown by a breaker when there is a considerable sea running. From it the South end of Long Island bears N. by E. ¼ E., 1¾ mile, and Egg Island E.N.E. 2 miles.

Bull Shoal. THE BULL SHOAL has 3 fathoms water on it, and bears from the Bull Rock W.S.W. ½ W., 4½ cables' length distant, and from the South-westernmost of the South-west ledges, South, 5¾ cables' length. From it the Old Man, Jedore Rock, and Jedore Head are nearly in one, and bear N.W. ½ W. It is rarely shown by a breaker, and therefore is extremely dangerous.

Brig Rock. THE BRIG ROCK has only 3 feet on it at low-water, when it is usually shown by a breaker, and in low spring-tides, accompanied by a heavy sea, its top becomes visible between the swells. Egg Island bears from it E.N.E. ⅔ E. 3¾ miles; Jedore Rock N.W. ¾ N. 3¾ miles; the Old Man (on with the centre of Jedore Cliff) N.W. by N., Northerly about 3 miles; and the Westernmost of the South-west Ledges, which always shows, N.E. by ⅔ E. 1½ mile.

Brig Shoal. THE BRIG SHOAL, which has 5 fathoms on it, bears from the Brig Rock S.E. by S. 4 cables' length, and from it the Bull Shoal and Rock are in line with the South side of Egg Island, bearing E.N.E. ¼ E. This shoal is dangerous after very heavy gales, when it is said to break at irregular intervals. The Brig Rock is most dangerous in fine weather, and at high-water, when it is not shown by a breaker. The Eastern extremity of Jedore Cliff in one with the Old Man, bearing about N.N.W. ¼ W., leads 4 cables' length to the Westward of these dangers, and between them and the East Pollock.

THE POLLOCKS are rocky fishing-grounds, on which the sea breaks after heavy gales, but on which we could find no less than 5½ fathoms; neither did the fishermen know of any less. The least water, 33 feet, is on the Inner Pollock, from which Jedore Rock, in one with the Eastern extremity of Jedore Cliff, bears N. by W. 3 miles; the Old Man in one with the West head of Jedore, North 2½ miles; and Egg Island, E. by N. 5⅓ miles. *The Pollocks.*

The Outer Pollock has 6 fathoms on it, and lies nearly a mile further off on the same line of bearing from Jedore Rock, and with Egg Island bearing E.N.E. ¼ E. 5½ miles.

The Middle Pollock, in 7 fathoms, lies nearly midway between the Inner and Outer Pollocks: and the Eastern Pollock, a very small patch of 7 fathoms, with deep water all around it, bears from the Inner Pollock E. ¼ N. half a mile. Jedore Cliff open to the Westward of Jedore Rock, leads to the Westward of them all.

DIRECTIONS.—Vessels running along the coast should pass outside of all the Jedore Ledges, and in not less than 40 fathoms water at night or in foggy weather; for the soundings are deep and very irregular near them all. There are 30 fathoms less than half a mile to the Southward of the Brig Shoal and Outer Pollock. *Directions.*

FISHING GROUNDS.—Of the dangers just described, the Hopkin and Macdonald Rocks, Tomfool Shoal, Pyche and Grizzle Rocks, and the Bull and Brig Shoals near the rocks of the same name, are discoveries resulting from this survey. So also are the following rocky fishing-grounds, on which the sudden shoaling of the water causes at times a very heavy sea, but which are not otherwise dangerous. Of these, the Yankee Bank bears from Shut-in Island S.S.E. ¾ E., 6¾ miles; and the Darby Bank, S.E. ¼ S., 6¾ miles, the least water on them being 14 fathoms. The other two lie off Egg Island, from which the Duck Bank, in 7 fathoms, bears S. by W. ⅓ W., 1½ mile; and the John Bank, in 12 fathoms, S. ½ E. 2⅓ miles. *Fishing Grounds.*

"THE POLLOCK RIP" of the old charts, and also the "foul ground" said to be doubtful off Shut-in Island, were searched for in vain, and doubtless do not exist, since they are unknown to the native fishermen. The rock grazed by H.M.S. Resistance was doubtless the Brig Rock; and the 8 fathoms, according to H.M.S. Carnation, one of the Pollocks. These should all be removed from the charts. *Pollock Rip.*

BALD ROCK is small, and only 8 feet high, and bears from Egg Island W. ½ N., 2½ miles. It is bold on the North and South sides, but reefs extend from either end of it to the distance of 1½ cable's length; and there is a sunken rock, with only 6 feet water on it, bearing from it W. by S. a quarter of a mile. The passage is clear, and a third of a mile wide between Bald Rock and the shoal water off Bald Island, within which, and the other islands next Eastward, there is a passage for small craft rendered dangerous by sunken rocks. *Bald Rock.*

THE BARSE ROCK AND HURLEY SHOAL are small rocky patches with 4 fathoms water on them, and with deep water all around them. They bear from Bald Rock, nearly S. by W., 2½ miles, and S. by E. 2¼ miles respectively, and lie directly in the way of vessels running along the coast, and are dangerous to large ships. The sea breaks over them in heavy gales. *Barse Rock and Hurley Shoal.*

JEDORE HEAD is a remarkable headland, 207 feet high, having at its S.W. extremity a small peninsula united to the main-land by shingle beaches inclosing a small pond, and from which a reef runs out half a mile to the S.W. On its Western side, the cliffs of red clay are 70 feet high, whilst on its South-eastern side Jedore Cliff may be seen, also of red clay, and 135 feet in height.

JEDORE HARBOR, the first harbor for ships to the Eastward of Halifax, has been inexcusably misrepresented in the old charts. Its entrance, which is distant 2¼ miles to the E.N.E. from Jedore Head, is 430 fathoms wide from the West head across to the opposite shore; but Thorn Shoal, with only 9 feet water on it, stretches out from the Western shore, just outside and across the entrance, so as to be greatly in the way of vessels entering. The channel between this shoal and the East head is 320 fathoms wide from the 3-fathoms line, and carries a depth of 26 feet at low-water over what is, properly speaking, the bar. On the Eastern side, and immediately within the entrance, Bar Point, composed of shingle, and inclosing a pond, will be seen; and from it Bar Shoal, a continuation of the shingle of Bar Islet, extends more than half-way across to the Western shore, diminishing the breadth of the channel to a cable's length, but forming no bar, the depth there being 6½ fathoms. The sandy beach of Marsh Point will be seen running out from the Western shore at 1½ mile within the entrance. The anchorage is secure within this beach in 7 fathoms, over mud, and in a channel 150 fathoms broad; but outside of it the bottom is of sand, and a considerable swell rolls in with strong winds from the Southward; nevertheless, the coasting schooners anchor there in fine summer weather. *Jedore Harbor.*

The channel, between flats of mud, weeds, and muscle-beds, which dry at low-water, continues clear and deep enough for the largest ships up to the Bown Islands, off English Point, which separates the Eastern and Western arms of the harbor, at

the distance of 4 miles from the entrance. Vessels may pass close round to the Eastward and Northward of these small islands, to the secure anchorage within or to the North-west of them; but the entrances to the arms, instead of being clear and deep, as misrepresented in the old charts, are nearly closed by shoals, which leave only very narrow and intricate channels, through which not more than 14 or 15 feet can be carried at low-water. But for all within these arms, we must refer the seaman to the Admiralty chart resulting from this survey, since no written description would avail; only remarking, that they are navigable for any vessel that can enter them, nearly to their heads, including Salmon Inlet to the Rapids at the entrance of Salmon River, which is 2 miles above the long wooden bridge that crosses the entrance of the inlet, 1½ mile up the Eastern arm.

To render Jedore harbor, with its narrow and crooked channel, easy of access, buoys would be required on Thorn and Bar shoals; meanwhile, the following remarks and description of the dangers, together with the directions that follow, will enable the intelligent seaman to use it as a harbor of refuge in case of necessity.

Jedore Rock. JEDORE ROCK.—Approaching the harbor, refer to the chart, and observe that Jedore Rock, of clay-slate, and 50 feet in height, is the Westernmost of the islands off its mouth. It bears from Jedore Head S.E. ½ E., 1½ mile, and the passage is clear between them, excepting some patches of 5 and 6 fathoms, on which the sea very rarely breaks. Arnold Rock is the only danger to the Westward of Jedore Rock, from which it bears S.S.W., half a mile distant, and dries at low-water, and can almost always be seen; but to insure passing to the Westward of it, and also of Arnold Shoal, which lies three-quarters of a mile further to the Southward, and has 6 fathoms on it, the harbor's mouth must be kept open to the Westward of Jedore Rock, from the West end of which a reef runs out 1½ cable's length. To pass to the Southward of Arnold Rock, Long Island must be kept open to the Southward of the Old Man, bearing E. by N.

The Old Man. THE OLD MAN is a small rock 12 feet high, and bears from Jedore Rock in line with Jedore Head, S.E. ½ E., two-thirds of a mile. It is bold on the Eastern side, but a small sunken rock, with only 4 feet water on it, lies a cable's length from it to the S.W. by S. Jedore Head, open to the Westward of Jedore Rock, leads clear to the Westward of it; and the passage is clear between it and Arnold and Jedore Rocks. There is also a clear passage between the Old Man and the Mehanny Rocks, some of which are dry at low-water, and can almost always be seen. They bear from the Old Man N.E., three-quarters of a mile; and beyond them, in the same direction, Gull Rock, together with Barren and Roger Islands, will be seen; the latter lying half a mile off shore, and three-quarters of a mile to the Eastward of the harbor's mouth.

Directions. DIRECTIONS.—To run for the anchorage in Jedore harbor from the Westward, proceed as follows:— Pass mid-way, or nearly so, between Jedore Head and Jedore Rock, steering E.N.E., so as to keep outside of Thorn Shoal until the steep bank (not the sand-beach) of Marsh Point touches the shingle beach of Bar Point, bearing N. by E. ½ E. Run in with these marks touching, until Roger Island touches East Head, bearing S.E. by E.; then alter course to N. by W. (to clear the Bar Shoal), and when between 1 or 1½ cable's length from the shingle beach on the Western shore of the harbor, keep away to the Northward and Eastward, so as to run along that shore, at any distance between a cable and half a cable's length, until up to the sand-beach of Marsh Point, which must be rounded to the Northward at the same distance, and anchor between it and Pea Point on the opposite shore, in about 7 fathoms, over muddy bottom. At or near low-water, when a part of the Bar Shoal is shown by breakers, and the steep mud-flats are visible on either side of the channel, is the most favorable time for entering this harbor.

In approaching the harbor from the Southward, the harbor's mouth should be seen between the Old Man and Jedore Rock, or the whole of Jedore Cliff should be open to the Westward of Jedore Rock, to pass to the Westward of the Pollocks, on which, however, no less than 5½ fathoms could be found. Leaving Arnold and Jedore Rocks to the Westward, pass midway between them and the Old Man, taking care to avoid the sunken rock off the latter; or, if it be preferred, pass to the Eastward of the Old Man, which is quite bold on that side, and when approaching the harbor's mouth, bring the marks on for running in, namely, the steep bank (not the sand-beach) of Marsh Point and the shingle beach of Bar Point touching, and proceed as before directed.

In approaching from the Eastward, the coasting vessels pass within Egg Island, and between the South-west ledges and Long Island, steering for Jedore Rock, and leaving outside of them the outermost of the ledges; but this should never be attempted by any who are not well acquainted with the place, for Macdonald and Hopkin rocks lie nearly in the way, and are the more dangerous because they are seldom shown by breakers. Besides, with a wind from the Southward or Eastward, a thick

fog often comes in very suddenly, and it would be perilous in the extreme for a stranger to be surprised by it among the ledges.

TIDES.—It is high-water, full and change, at Arnold Cove, 2½ miles within the entrance of Jedore Harbor, at 7h. 45m. after the moon's transit, and the rise in ordinary spring and neap tides is 6½ and 4¾ feet respectively. The streams change almost immediately after high and low water, and do not exceed the rate of 2 knots. In the entrance of the harbor the times will be a few minutes earlier, the rise 2 feet less, and the ordinary rate of the streams one knot. The in-draught of the flood-tide is felt several miles off this harbor, and the inlets to the Westward of it. *Tides.*

CLAMB BAY.—Immediately to the Eastward of Jedore Harbor are Roger and Barren Islands (already noticed), which vessels may pass within or between in case of necessity, and which may afford shelter to fishing vessels in fine summer-weather, but no safe anchorage for ships. Outside of these islands are Gull and Mehanny Rocks, and to the Eastward of them Middle or Sunk Rock, Spritsail, Sister, North Sister, and Siteman Rocks; Duck Island, with its ledges, rocks, and shoals; the Sugar-loaf and Goose Island, with its ledges. These all lie across Clamb Bay, which affords no safe anchorage; and as they are out of the way of shipping, we shall merely refer the seaman to the chart for them, naming only Long Island, which being three-quarters of a mile in length, and bearing from the East head of Jedore harbor S.E. by E. 4 miles, may be easily distinguished. *Clamb Bay*

HARBOR ISLET lies three-quarters of a mile off the entrance of Musquidoboit Inlet, and bears from Jedore Head N.W. ¾ W., about 1½ mile. It is small and stony, and from it a rocky shoal, on which are the Musquidoboit ledges, extends upwards of a mile to the Southward, and to within half a mile of the Musquidoboit shoal. A depth of 2½ fathoms may be carried past Harbor Islet on either side, but it is all covered with breakers in a strong Southerly wind, and is altogether an exceedingly dangerous place. At low-water, when the Duke Rocks and the Bull Reef on either side of the entrance, and the mud flats on either side of the channel, become visible, is the most favorable time for a stranger to attempt to enter this, and also the other inlets. *Harbor Islet.*

The shores of these inlets are well settled, especially near their heads, where the road from Dartmouth passes and continues to Ship Harbor, and is soon to be extended further Eastward.

TIDES.—At the entrances of these inlets it is high-water, at full and change, 7½ hours after the moon's transit. The rise in ordinary spring-tides is 4½ feet, and in neaps 3 feet. The ordinary rate of the tidal-streams in the entrances is from 2 to 3 knots; but heavy rains, or the melting of the winter's snow, have been known to increase the rate of the ebb-stream in the entrance of the Musquidoboit Inlet to fully 4 knots. *Tides.*

MUSQUIDOBOIT INLET is much larger than that of Perpisawick, and contains many islands, and is navigable for small craft and boats 7 miles inland, to where it receives the waters of the Musquidoboit River. Over the bar, at the entrance of the principal channel, which is on the Eastern side of the inlet, and 1¾ mile N.N.W. from Jedore Head, a depth of 10 feet can be carried at low-water; but Dunbrock Rock, with only 3 feet water on it, lies directly in the way, and renders the entrance both difficult and dangerous. Within the bar there is a depth of 4 fathoms in a channel 120 fathoms wide, and between flats of sand, mud, and weeds, which uncover at low-water. At about 4 miles within the bar, the channel becomes very narrow, and only 7 or 8 feet deep; but small craft and boats can ascend with the tide to the head of the inlet. *Musquidoboit Inlet.*

PERPISAWICK INLET is the next to the Eastward, and is also half a mile wide at the entrance, which lies on the West side of Perpisawick Head. After crossing the bar of sand, about a mile within the entrance, and on which there are only 6 feet at low-water, a narrow channel, between mud-flats uncovered at low-water, commences, and is navigable for any vessel that can cross the bar to the head of the inlet, a direct distance of 5 miles. Within a mile from the head of the inlet, the mud-flats retire on either side, leaving an open space, in which there are 9 fathoms water. There are reefs off the entrance-points of these inlets, and a small rock, with only 6 feet water on it, lying a quarter of a mile off the Western side of Perpisawick Head. On these the sea breaks heavily, as it does also on the bars, which are very dangerous to boats. *Perpisawick Inlet.*

CHISSETCOOK INLET is half a mile wide at its entrance between Cape Entry and Story Head, the latter bearing from Shut-in Island N.E. by E., 3¾ miles; but it is of no use to shipping, having only 3 feet at low-water on the bar of the Western and principal channel. *Chissetcook Inlet.*

Jedore Head. JEDORE HEAD.—From Shut-in Island, Jedore Head bears about due East, nearly 10¼ miles; a distance in which the features of the coast are exceedingly remarkable, every headland being a peninsula, presenting a cliff of red clay to the wasting action of the waves. These peninsulas are joined to the main-land by beaches of rolled stones and shingle; they are more or less wooded, and nowhere exceed the height of 140 feet above the sea.

Before noticing the inlets, we will describe the dangers off this part of the coast, which are not to be found in the charts in general use previous to our survey.

Pat Shoal. PAT SHOAL is a small rocky patch, with only 4½ fathoms water on it, bearing from Shut-in Island E. ¾ N. nearly 3 miles, and from Story Head S. by W. 1½ mile. There are 12 fathoms water a quarter of a mile to the Southward of it.

Perpisawick Shoal. PERPISAWICK SHOAL is a similar patch of rock, with 4¾ fathoms water on it, bearing from Shut-in Island E. ¾ S. 5½ miles; and from Perpisawick Head S. ¾ W. 2½ miles. There are irregular soundings of 6½ and 7 fathoms for a short distance around it, and 16 fathoms outside, or to the Southward of it, within the distance of half a mile.

Musquidoboit Shoal. MUSQUIDOBOIT SHOAL is of rock, and 600 fathoms in length, from N.E. to S.W. The least water on it, 3 fathoms, is nearly in its centre, and bears from Jedore Head W. by S., distant 2 miles. These shoals, which all lie outside of a line drawn from Shut-in Island to Jedore Head, are exceedingly dangerous to large ships. The last-named is frequently shown by breakers; the two first only occasionally, after heavy gales, when they break at irregular intervals, and become dangerous to small craft and boats.

Codray and Round Shoals. CODRAY AND ROUND SHOALS lie nearer inshore, and are, therefore, less in the way of vessels. The least water on them is 4¼ fathoms. The former bears from Perpisawick Head, the reefs of which extend nearly out to it, S.W. by S., nearly a mile; and the latter from Flying Point, on the Western side of the entrance of Musquidoboit Inlet, S.W. ½ W., about the same distance.

FROM MARS HEAD, OR CAPE PROSPECT, TO SHUT-IN ISLAND, INCLUDING HALIFAX HARBOR.

Mars Head, Cape Prospect. MARS HEAD, or CAPE PROSPECT, a rocky peninsular cape, rising 70 feet above the level of the sea, forms the Western limit of Pennant Bay, the entrance to which is 3 miles wide in an E.S.E. and W.N.W. direction, and about 2 miles deep.

The bay is much encumbered with rocky shoals and islands, but it affords shelter to those acquainted with the passages between them. The land at the head of the bay is of moderate height, Hospital Hill, the highest point, rising 250 feet above the sea.*

Turner Bay. TURNER BAY, at about 2 miles from Mars Head, the North-western angle of Pennant Bay, is open to the South-south-east, but the anchorage is good in 8 or 9 fathoms, mud, off the fishing-coves, within Church Point, on the Southern shore.

Western Passage. WESTERN PASSAGE.—To enter by the Western passage, bring Turner Bay Rock (formerly White Rock) to bear N.E. ½ E., and steer for it, passing midway between Broad Rock, which covers at high-water, and the Puffer Shoal, on which the sea is said always to break. Pass Westward of Turner Bay Rock, between it and Black Shoal, keeping nearer to the former, which is quite bold on that side, taking care not to haul to the Westward into the bay until past the 13-feet shoal, which lies a quarter of a mile N.N.E. ½ E. from Black Shoal, and 2 cables' length off Pennant Point, formerly called Macivoith Point. On the old charts, this passage is recommended, but its principal dangers, the Flat-roof and Puffer Shoals, are omitted.

Eastern Passage. EASTERN PASSAGE.—This passage is preferable in some winds. Stand in for the Western end of Mackerel Island on any bearing not to the Eastward of N.E. by N., until Church Point is in line with the North-east side of Turner Bay Rock, bearing N.N.W. ¾ W., then alter course, and steer with those marks in one, until you approach the rock; when sheer gradually to the Northward, so as to pass one cable's length to the N.E. of it, and then to the N.W., to the anchorage off the fishing-coves as before.

Pennant Harbor. PENNANT HARBOR, at the North-eastern angle of the bay, has secure anchorage above the islands, as stated on the former chart, in which the dangerous Middle Ground, with 13 feet least water, is omitted, being directly in the way of vessels taking what is called the good channel, between Pennant Point and Pennant Island. Two other shoals at the head of the harbor, are also omitted.

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* See Admiralty chart, Mars Head to Shut-in Island by Captain Bayfield, R. N., and his assistant officers, 1853.

DIRECTIONS.—To enter, pass Eastward of Bald Rock, at the distance of one cable, steering N.E. for the Thrumcap until the Seven Islands open out to the Northward of Pennant Island, when the Middle Ground will be passed, and you may haul round to the Eastward and Northward of the Thrumcap at the distance of one cable, so as to pass between it and the rocky 18-feet shoal that lies a quarter of a mile N.E. by E. from it. Having passed to the Westward of this shoal, anchor within Martin and Saddle Islands, as convenient, from one to two and a half cables from them, in 6 or 7 fathoms, mud bottom. In rounding Pennant Point, beware of the reefs which extend 2 cables off it to the Southward and Eastward. *Directions.*

SAMBRO HARBOR lies at the head of the bay formed between Pennant Point on the West, and Cape Sambro on the East. It has anchorage within the Isle of Man, the Thrumcap of the fishermen; the name Isle of Man, however, is preferable, although not used by the natives, to avoid the confusion of so many Thrumcaps. The heavy sea in South-west winds is in great measure broken by the ledges outside, but the shelter is imperfect, and the dangers off and in this harbor are so numerous, that it should never be attempted by a large ship, excepting in a case of extreme necessity. *Sambro Harbor.*

DIRECTIONS—FROM THE WESTWARD.—Enter between the Bull Rock and Pennant Point, steering N.E. by E. for the Isle of Man; and, having passed Bull Rock, at the distance of 1½ or 2 cables, to avoid the shoal water off it to the Northward, keep the East side of the Isle of Man and Round Island in line, if the latter can be made out; if not, pass one or two cables to the Eastward of Island Rock, still steering N. E. by E. for the Isle of Man, until beyond Torpy Ledge; then, to avoid the Middle Ground, steer more Easterly, so as to pass not more than a cable to the Northward of the West end of Inner Sambro Island, which is quite bold. As soon as Fairweather Rock and the Western edge of Inner Sambro Island are nearly in line S.W. by S., alter the course to N.E. by N., running from them, and they will lead clear to the Eastward of Cowley Rock; having passed this, haul to the Northward and Westward round the Isle of Man, and anchor within it and Black Reef, from a half to two cables from them, in 6 or 7 fathoms, over mud bottom. *Directions.*

Further in there are several secure anchoring-places for small vessels, as the Mud Hole, the Basin, &c.; but the rocks are too numerous for a large ship to venture among them with safety.

FROM THE SOUTHWARD.—Having Chedabucto Head open to the Eastward of Sambro Island, to insure being outside of the S.W. breaker, which, however, can generally be seen, bring Cook Point (on the West side of Sambro Harbor) in line with the Western point of Inner Sambro Island, bearing N. ¼ W., and steer for them, and they will lead clear to the Eastward of the S.W. breaker; having passed it, continue the N. ¼ W. course, keeping the marks touching until nearly abreast of Fairweather Rock; then alter the course so as to pass midway between that rock and the Western end of Inner Sambro Island, and round the latter to the N.E., until the marks come on for clearing Cowley Rock, namely, Fairweather Rock and Inner Sambro Island touching, and bearing S.W. by S.; when steer from them N.E. by N., as before directed. *From the Southward.*

FROM THE EASTWARD.—In passing either between or within the Sambro Ledges, and within or without Inner Sambro Island, the aid of the new chart, or of a native fisherman acquainted with all the dangers, would be indispensable; for Cowley Rock, having 10 feet water, seldom breaks, and being in mid-channel, directly in the way of vessels running into Sambro Harbor, it is among the most dangerous of the omissions in the former chart; whilst the Thrumcap Rock, which, having 24 feet least water, breaks only in heavy weather; the Paddle Rock, with 8 feet, and shoals around it, and Bigfish Shoal, with 12 feet, are also omitted. *From the Eastward.*

But still more dangerously erroneous are the tracks, drawn on the chart (Nova Scotia, Sheet VII.) at present in use, for running, in case of emergency, between the Sambro Ledges and the main-land. They are said to be adapted for a line-of-battle ship, but to follow them would probably be fatal, for the inner of the two tracks passes directly over the Paddle Rock and Bigfish Shoal, and also over rocky patches of 18 and 24 feet between Whaleback Rock and Fairweather Rock; whilst the outer track, besides leading over several rocky patches of 24 feet, which break in heavy weather, passes also very near Colt Rock, in 15 feet water, and close to Nick Shoal. None of these dangers are shown in the old chart. Nearly half the Sambro Ledges are omitted in it, and the outermost of them are laid down too near the shore by half a mile.

SAMBRO ISLAND LIGHT-HOUSE is a white octagonal tower, showing a fixed light 115 feet above the sea at high-water, and visible 21 miles distant in clear weather. It is 1⅓ mile from the shore at Cape Sambro, and bears from Chedabucto Head (the Western point of entrance to Halifax Harbor) S.W. 4⅓ miles. In foggy weather vessels are warned, by heavy guns on the island, of their approach to the dangerous ledges around it. It is the resort of pilots. *Sambro Island Light-house.*

Sambro Ledges. THE SAMBRO LEDGES will be found fully and correctly represented for the first time in the Admiralty chart resulting from our survey; and it will, therefore, only be necessary here to state that, from the outermost of the Western ledges, the Smithson Rock, in 12 feet least water, Sambro light bears E.N.E. nearly (N. 65° E.) 2½ miles; and Pennant Point, N.W. by N. (N. 33° W.) 2¼ miles. Fairweather Rock in one with the Isle of Man, bearing N.N.E. ¼ E., and Gull Rock little more than its own breadth open of White Head (Catch Harbor Head of the fishermen), bearing N.E. ¾ E., lead right over this dangerous rock, and also over the Mare, which, with 6 feet least water, is nearly three-quarters of a mile further in.

South-west Breaker. THE SOUTH-WEST BREAKER, which almost always shows, is 1¼ mile further to the Eastward; Chedabucto Head is seen from it over the Eastern extremity of Sambro Island, bearing N.E. ¼ N., 1½ mile.

The Sisters. THE SISTERS are the outermost of the Eastern ledges, and are distant 1¾ mile from the light-house, between the bearings from it of E. by N. and E. by S. Their position is pointed out by Black Rock, which is 15 feet high, and from which they are distant one-third of a mile to S.E. by E. Several of them uncover at low-water, and can always be seen, but the Blind Sister is more dangerous, being covered by 9 feet at low-water; the Black Rock bears from it N. ¾ W., half a mile, and Broad Breaker, which almost always shows, W. ½ N., 4 cables. Nick Shoal and Ede or Owen Rock, the latter in 9 feet least water, are nearly midway between the Sisters and Morris Point, on the Western side of Catch Harbor.

Clearing Marks. CLEARING MARKS.—The fixed light of Sherbrook tower, on Maugher Beach, kept just open East of Chedabucto Head, bearing N. by E., will clear all the Sambro Ledges, and also Bell Rock and Duncan Reef; and Sandwich Point in line with Chedabucto Head, bearing N. ½ E., will lead one mile to the Eastward of them.

The lead gives little or no warning when approaching these ledges from the Eastward, on which side the bank is very steep, there being 45 fathoms within less than half a mile from the Sisters. The erroneous position assigned to these ledges in the charts hitherto in use, has greatly added to their danger.

The Hennesy and Lockwood Rocks, of the old charts and directions, could not be found by our parties, nor by Captain Shortland, who has also examined the alleged positions in H.M.S. Columbia. They doubtless do not exist, for rocks covered only by 8 or 12 feet water would cause breakers almost constantly, and thereby become conspicuous; but neither the native fishermen nor the light-house keepers have ever seen them.

The Hennesy Bank. THE HENNESY BANK, of the fishermen, is a small rock with 8 fathoms instead of 8 feet over it, and is three-quarters of a mile to the Southward of the Blind Sister. Sambro light-house bears from it N.W. by W., 1¾ mile. The shoal ground is a mile further out, with 8 fathoms least water on it; the light-house bears from it N.N.W. ¾ W. 2 miles.

Barse Ground. THE BARSE GROUND is a rock with 9 fathoms least water; the light-house bears from it N. by E. 2¼ miles, and from the Outer Bank in 14 fathoms, N. by W. 4¼ miles. These are rocky fishing-grounds, which are no further dangerous to vessels than that they cause a heavy half-breaking sea in bad weather. The Sambro Bank continues out 2½ miles beyond them to the depth of 30 fathoms, terminating in a point from which the light-house bears North 6¾ miles.

Catch Harbor. CATCH HARBOR bears due North from the Easternmost of the ledges, and is 2 miles S.W. from Chedabucto Head. It has 9 feet on its bar, and 16 feet mud within, where its shores are occupied by the houses and stages of fishermen. At its head there is a chapel and a fine stream, the outlet of the waters of several small lakes which lie about a mile to the Northward.

Bell Rock. THE BELL ROCK, with 7 feet least water, is half a mile East from White Head, and 4 cables' lengths off shore, with Chedabucto Head bearing N.N.E., distant one mile. We discovered another rock with 27 feet water on it, one cable N. by W. from the Bell Rock; and as Duck Reef extends a cable and a half from the shore towards them, the channel between them and the land is reduced to this breadth, and is, moreover, nearly overlapped by Duncan Reef; it, therefore, cannot be recommended, as it is in the old chart. Duncan Cove, on the South-west side of Chedabucto Head, affords shelter to boats.

Halifax Harbor. HALIFAX HARBOR is one of the finest in the world, affording space and depth of water sufficient for any number of the largest ships with safety; and although the dangers of its entrance are such as to render great caution necessary, especially in the fogs which usually accompany all winds from the sea, it is yet easier of access and egress than any other large harbor on the coast. It is 5½ miles wide at its entrance from Chedabucto Head on the South-west, to Devil Island in the North-east, and continues inland 15 miles, in a Northerly direction, to the head of Bedford Basin. The city of Halifax, the capital of Nova Scotia, containing at this time about 25,000 inhabitants, stands on the declivity of a peninsula on the Western side of the harbor,

and 9 miles within its entrance. The Citadel, immediately in rear of the city, is elevated 227 feet above the sea at high-water, and with its flagstaff forms a leading-mark easily recognized from a vessel off the entrance of the harbor.

The town of Dartmouth stands on the Eastern side of the harbor, immediately opposite the Naval Yard; steamers ply between it and the city continually; and Eastern fort, with its tower, will be seen 2 miles further to the Southward, on the same side of the harbor.

CHEDABUCTO HEAD, the Southern extreme of the Western shore at entrance, bears from Sambro Island light-house N.E. 4¼ miles. It is 106 feet high, and consists of a whitish granite, which, together with clay slate, forms the steep and barren Western shore of the harbor. Proceeding Northward, Portuguese Cove, with its village of fishermen, and Camperdown flagstaff, on a hill in rear of it, 168 feet above the sea, will be seen 2 miles within Chedabucto Head. *Chedabucto Head.*

HERRING COVE, distinguished by the steeple of a chapel, and the houses of the fishermen on its rocky shores, is 3 miles further in, and distance 1¼ mile S.W. from Sandwich Point. It is a secure harbor for small craft and boats, having 6 feet at low-water in its narrow entrance, and 8 feet over soft mud within. At its head a brook discharges the waters of a chain of small lakes. *Herring Cove.*

YORK REDOUBT, 177 feet above the sea, will be known by its flagstaff and by its position, three-quarters of a mile within Sandwich Point, and nearly opposite the Light-house Tower on Maugher Beach. Pleasant Point, at the entrance of the North-west arm, is 1¼ mile further in, and will be recognized by its batteries, and by the tower on its summit, 114 feet above the sea; so also will George Island, by its redoubt and tower, which is at the same distance further in, and off the outer part of the city. *York Redoubt.*

DEVIL ISLAND, on the Eastern shore of the harbor, is composed of clay slate; it is 15 feet high, one-third of a mile in length, and the same distance from Hartland Point, the Eastern point of entrance of the harbor. A reef connects it with the shore, and shallow water extends from it one-third of a mile to seaward. The light-house, of wood, painted brown with a white belt, stands on the South-west point of the island, and shows a fixed light, red to seaward, 40 feet above high-water, and visible in clear weather from a distance of 8 miles. Pilots are stationed on the island, and several families reside there. *Devil Island.*

The Eastern shore of the harbor is less rocky and barren than the Western, being formed of ridges of drift sand, clay, and boulders, resting on clay slate; it is inhabited all the way to Dartmouth. Three-fourths of a mile Northward from Devil Island is Barrie Beach (of shingle), and inclosing a shallow pond, which affords shelter to boats.

EASTERN PASSAGE.—The entrances to the Eastern passage lie on either side of Lawler Island; that to the Eastward, between the island and the main being the deepest, and having 10 feet over its bar at low-water. Only 5 feet at low-water can be carried through between Lawler and Macnab Islands; and there are rocks in the entrance, and off the South end of Lawler Island, as will be seen in the chart. *Eastern Passage.*

This passage being very narrow, and fit only for small vessels, it will only be necessary to direct attention to the 6-feet shoal, a cable and a half distant from a brook on the Eastern shore of the main-land, and half a mile within Lawler Island, as well as to the rock 60 fathoms off the North-east point of Macnab Island; these being the only detached dangers in the passage after passing the bar.

MACNAB ISLAND, which forms the Eastern side of the ship-channel, is 3 miles long, including its shingle beaches. It is well cultivated, and its hills of sand, clay, and boulders, rise to the height of 152 feet above the sea. *Macnab Island.*

THE THRUMCAP is connected to its Southwest extremity by long shingle beaches, inclosing a shallow pond. It is an islet at high-water, at present 33 feet high and 150 fathoms long, but its cliff of red sand and clay is fast wasting by the action of the waves. The Thrumcap Shoal extends from it one mile to the Southward, forming one of the principal dangers in the entrance of the harbor. At its South-west extremity is a red buoy, carrying a small flag, like all the other buoys, excepting that on Pleasant Shoal. It lies in 8 fathoms water, with George Island just open to the Westward of Ives Point, Graham Head (ten miles to the Eastward) well open to the Southward of Devil Island, and the light-house on the latter bearing E. ½ N. 2 miles. *Thrumcap.*

SHERBROOK TOWER LIGHT, at the West extremity of Maugher Beach, bears from the Thrumcap buoy N. by W. 2½ miles, and shows a bright (not red) fixed light, 58 feet above the sea, and visible from a distance of 12 miles. *Sherbrook Tower Light.*

THE LIGHT-HOUSE BANK continues out from this beach three-quarters of a mile to the Southward. Devil Island light-house open South of Macnab Island, seen over the shingle beaches, and bearing S.E. by E. ½ E., clears its South point in 5 fathoms. From the least water, (18 feet,) the light-house is in one with Ives Point, and is distant half a mile. *Light-house Bank.*

Shallow water extends also Westward and Northward from Maugher Beach to the distance of 2 cables. In the latter direction it dries at low-water, and is called the

Horse-shoe, which vessels should beware of in entering or leaving Macnab Cove, where the anchorage is good in 7 or 8 fathoms, mud; the best berth being with Sandwich Point seen over the Horse-shoe, and the Western sides of George Island and Ives Point in one.

Ives Point. IVES POINT, the North-west extremity of Macnab Island, is a steep clay bank, with a shingle beach curving out from it to the N.E., and Ives Knoll, awash in low spring-tides, stands on the rocky bank which runs out 4 cables from the beach to the Northward, or towards George Island. A red buoy is moored in 8 fathoms, near the Western side of this bank, and distant one cable West from the knoll.

Rock Head Shoal. ROCK HEAD SHOAL.—Having pointed out the dangers on the Eastern side of the ship-channel, let us turn to the dangers in the entrance, and afterwards to those of the Western shore. Of the first, the outermost and most dangerous is the Rock Head Shoal, with 20 feet least water, which lies with the tower of George Island in line with Ives Point, bearing N. by W.; Sambro Light-house Island touching White Head, bearing S.W. ¼ W., the light-house being open; and Devil Island light-house bearing N.E. 2¼ miles.

A black and white beacon buoy carrying a bell, has been replaced on this shoal as formerly, and is moored near its South-west end in 6¾ fathoms water. rocky bottom, with the Eastern end of George Island in line with Ives Point, and Sambro Light-house Island open of White Head.

Portuguese Shoal. PORTUGUESE SHOAL (omitted in the old chart) is half a mile W.S.W. from the Rock Head. The least water on it, 5 fathoms, is with George Island just touching the West side of the light-house tower on Maugher Beach, with Sambro Light-house Island concealed behind Chedabucto Head, and Camperdown Flagstaff bearing W. by S. A black buoy on its Western side marks the Eastern side of the preferable channel for large ships; it is moored in 6 fathoms, with George Island just open to the Westward of the light-house tower on Maugher Beach, bearing N. ½ W.; Camperdown flagstaff bearing W. by S.; and Devil Island light-house, N.E. ⅔ E.

Leading-marks. LEADING-MARKS.—Sambro Light-house Island well open S.E. of White Head, and bearing S.W. ½ W., leads clear to the Southward of the Rock Head and Portuguese Shoals. The tower on George Island touching the East side of the light-house tower on Maugher Beach, bearing N. ¾ W., will lead through between them; and George Island well open to the West of the light-house tower on Maugher Beach, bearing N. ¼ W., will lead clear to the Westward of them, and also nearly midway between the Neverfail and Thrumcap Shoals.

Neverfail Shoal. THE NEVERFAIL SHOAL carries 27 feet least water, from which the Eastern side of George Island appears in line with the steeple of the R. C. chapel at Dartmouth, and the tower on Pleasant Point over the point at York redoubt; the South-east end of Lawler Island over the South-east extremity of the shingle beach, Southward of the Thrumcap; and Hartland Point over the Northern point of Devil Island, and in line with the Thrumcap buoy bearing E. by N., distant about one mile.

Litchfield Rock. THE LITCHFIELD ROCK, with 15 feet least water on it, lies two-thirds of a mile W.N.W. ½ W. from the Neverfail. The white buoy, on its Eastern side, lies with the tower on George Island in line with Sandwich Point; Devil Island and Hartland Point touching, and bearing E. by N.; and the steeple of the chapel at Herring Cove bearing N.W. by N. George Island open East of Sandwich Point bearing N. ½ E., leads clear to the Eastward of it, and the Citadel flagstaff in line with Sandwich Point bearing N. 4° W., will lead through between it and the Neverfail, which is the most direct, and therefore the preferable channel, although the deepest water is between the Litchfield and the land, from which it is distant three-quarters of a mile.

Mars Rock. MARS ROCK, in 20 feet least water, is on a rocky bank, separated from the shore by a very narrow channel; a white buoy is moored in 6 fathoms on the Eastern side of it, with the Citadel flagstaff, and also the town clock, just open East of Sandwich Point, distant three-quarters of a mile; Hartland Point open South of the Thrumcap beaches, and the North side of Herring Cove, W. by S.

Middle Ground. THE MIDDLE GROUND, carrying 28 feet least water, bears W. ⅓ N. half a mile from the Northern point of Macnab Cove, and E.N.E. from the steeple of the R. C. chapel at the village of Falkland. The steeple of the R. C. chapel at Dartmouth in line with the Eastern side of George Island, leads clear to the Eastward of it; and Chedabucto Head only just open East of Sandwich Point, to the Westward of it.

Pleasant Shoal. PLEASANT SHOAL, which extends nearly half a mile S.E. from Pleasant Point, dries in some parts, and is covered by only a few feet of water nearly out to its edge. It is much in the way of vessels, diminishing the breadth of the channel between it and Ives Point to half a mile. A white buoy, without a flag, is moored close to its Eastern extremity in 7½ fathoms, with Sandwich Point open East of Chedabucto Head, and with the North point of Macnab Island only just open North of the bank of Ives Point, and seen over its beach, bearing E. by N. The entrance of the North-west arm is between the Western side of Pleasant Shoal and the shoals in Purcel Cove. It

is 8 fathoms deep; and the largest ships may ascend the arm through a narrow channel to within half a mile of its head, or nearly to Melville Island, a distance of 2¼ miles.

Reid Rock. REID ROCK is 6 cables further in, on the same side of the channel, and 2 cables off shore. It is small, with 5 feet least water. and its position is pointed out by a buoy moored in 8 fathoms, and bearing from Ives Knoll buoy on the other side of the channel W. by N. half a mile. Chedabucto Head open of Sandwich Point, leads to the Eastward of Reid Rock, at the distance of 2 cables.

Belle-isle Spit. BELLE-ISLE SPIT lies two-thirds of a mile further in, and continues out a quarter of a mile from the shore to a buoy in 5 fathoms, from which the South-east point of George Island bears E.N.E. one-third of a mile. About a quarter of a mile further in, on the edge of the bank, in 5 fathoms, and distant three-quarters of a cable from the Engineer wharf, is the Leopard buoy, which, together with the Belleisle buoy, marks the Western side of the channel, between them and George Island, which is clear and deep, and a cable and a quarter wide, from 5 fathoms to 5 fathoms.

To the Eastward of George Island the channel is half a mile wide, and equally free from obstructions; the shallow water does not extend beyond three-quarters of a cable from either end of George Island, and not above half a cable from either side.

Dock-yard Shoal. DOCKYARD SHOAL.—After passing the Leopard buoy, the deep water approaches very near the wharves of the city, until we arrive at the shoal, which extends a cable and a half out to the South-east from the dock-yard wall. The Commissioners' buoy is moored on the Eastern edge of this shoal in 5 fathoms, and just within it there are only 9 feet at low-water.

Dartmouth. DARTMOUTH.—It only remains to notice the shallow water off Dartmouth, which extends a cable and a fifth out from the wharves to 5 fathoms, and a cable and a half South from the point of clay cliff in Dartmouth Cove. There is also a detached rock carrying 23 feet outside the 5-fathoms line, and bearing S.W. ½ S. a cable and a half from the Ferry wharf. The points on the Eastern side of the Narrows in one, and bearing N.W. ½ N., lead half a cable to the Westward of this rock.

Narrows and Bedford Basin. THE NARROWS AND BEDFORD BASIN.—There is a clear passage for the largest ships through the Narrows into Bedford Basin, which is 36 fathoms deep, and navigable quite to its head. The principal danger is the Wellesley Rock, 13 feet at low-water, about one-third over from the Eastern towards the Western shore; and with the outermost bare rock off the Eastern shore in one with a house at the head of the basin, and bearing N.N.W. 3 cables. Immediately after passing the Wellesley Rock, the channel is contracted by islets and rocks on either side, to the breadth of a cable and a half; but it is 9 fathoms deep, and leads to a perfectly secure anchorage off the entrance of Sackville River, in 7 fathoms, mud.

Navy Island Anchorage. NAVY ISLAND ANCHORAGE.—On the Eastern side of the basin, 1½ mile from the Narrows, there is a small but secure anchorage within Navy Island. The entrance is to the Northward of the island, and the only thing in the way is an old wreck, over which there is a depth of 18 feet at low-water.

Aspect. ASPECT.—The coast in the vicinity of Halifax is of moderate height, the hills near shore being seldom 200 feet above the sea. To the Eastward of the harbor, as far as Jedore, almost all the headlands present cliffs of reddish sand, clay, and boulders, to the wasting action of the waves; whilst to the Westward, as far as our survey has extended, granite rocks nearly white predominate. Hence the remark, that, "in standing in for the land, you may know on which side of Halifax Harbor you are, by a remarkable difference that takes place immediately from its mouth in the color of the shores, which, if red, denotes that you are to the Eastward, and if white, to the Westward of it."

Approaching from Sea. APPROACHING FROM SEA.—The bank off Sambro, terminating in a point, and at the depth of 50 fathoms, 5 miles South of the Ledges, offers considerable assistance to vessels approaching Halifax from the Westward in the thick fogs which so frequently prevail. From the Eastward the approach is rendered comparatively easy, by the absence of outlying dangers after passing Shut-in Island, and by the soundings deepening out with tolerable regularity to 30 fathoms, at distances varying from 4 to 6 miles from the shore, until within 2 miles of Chedabucto and White Heads, where the depth exceeds 30 fathoms, until we arrive within one-third of a mile from the shore. Attention to these soundings, combined with the guns fired from Sambro Light-house Island, may enable steamers at times to enter the harbor notwithstanding the fog, but it is seldom prudent for a large sailing vessel to attempt it under such circumstances.

From the Westward at Night. FROM THE WESTWARD AT NIGHT.—In approaching from the Westward at night, steer so as to pass not less than 3 miles to the Southward of the Sambro Island light, steering E.N.E., and in not less than 30 fathoms water, until the light bears North; when, if not more than 6 miles from it, the vessel will have arrived at the Southern prolongation of the Sambro Bank. Having crossed the bank into deep water, change the course to N.N.E., until the light on Maugher Beach opens out East

of Chedabucto Head, bearing N. by E., when steer for it, or so as to pass within a mile or less from Chedabucto Head, which is quite bold. Having done so, keep the light bearing between North and N. by E. as you run towards it, and all the dangers will be avoided excepting the Neverfail, on which there is not less than 4½ fathoms.

Having arrived abreast of the Thrumcap, or brought Devil Island light in line with its South extremity, bearing E.S.E., change the course to N. by W., or as may be necessary, to avoid the Light-house Bank; and as soon as the light bears East, change the course to N. by E. for Ives Point, (or N.N.E., if necessary, to avoid the Middle Ground, on which, however, there are not less than 4½ fathoms,) until the light on Maugher beach bears S. by E.; then a N. by W. course, keeping the light astern, will lead between the Pleasant Shoal and Reid Rock buoys on the one side, and Ives Knoll buoy on the other into the harbor. Having passed Ives Knoll, the vessel may proceed in on either side of George Island, or may anchor in the stream of Macnab Island until daylight, according to circumstances. The light on Maugher Beach disappearing behind Ives Point, will show the vessel's distance from George Island, as she runs in to the Eastward of that island, which is the wider and preferable channel in a dark night.

Within George Island there is nothing in the way, excepting the Dock-yard Shoal, and the shallow water off Dartmouth.

From the Westward by Day. FROM THE WESTWARD BY DAY.—Approaching from the Westward in the day-time, pass Sambro Island light-house at the distance of 3 or 4 miles, and when Sandwich Point opens out East of Chedabucto Head, stand in N. by E. or N.N.E., according to the wind, until the Citadel flagstaff opens East of Sandwich Point, bearing N. ½ W. Keep the Citadel flagstaff only just open, running towards it, and it will lead between the Litchfield and Neverfail Shoals, and up to Mars Rock buoy, which leave to the Westward, and having passed Sandwich Point, from which the shallow water does not extend beyond a cable's length, steer towards George Island, keeping Chedabucto Head only just in sight East of Sandwich Point until you have passed close to the Westward of the Middle Ground; then open out the head more, so as to leave the Pleasant Shoal and Reid Rock buoys on your left hand, as you run towards George Island; or, if it be preferred, the R. C. steeple at Dartmouth in one with the Eastern side of George Island, bearing North, will lead to the Eastward of the Middle Ground. Either of the marks just given will lead clear up to George Island, on either side of which the vessel may pass into the harbor, leaving the Belle-isle and Leopard Buoys on her left, if she passes between them and the island, and choosing her anchorage off the wharves of the city, or off the dock-yard, where the Commissioners' buoy will point out the dock-yard shoal.

From the Eastward by night. FROM THE EASTWARD BY NIGHT.—Approaching from the Eastward by night, and being to the Westward of the Jedore ledges, run along the land in not less than 30 fathoms, until the fixed light on Sambro Island is seen; then, if it be intended to pass to the Southward of the Rock Head and Portuguese Shoal, steer for Chedabucto Head (remembering that, to clear the Rock Head, the light on Sambro Island must be kept wide open S.E. of White Head, bearing nothing to the Southward of S.W. by W.; and the red fixed light on Devil Island nothing to the Eastward of N.E. by N.), until the light on Maugher Beach bears North; when steer for it, keeping it bearing between North and N. by E., and proceeding as above directed.

In the day-time, steer for Chedabucto Head until the Citadel flagstaff is only just open East of Sandwich point, bearing N. ½ W.; then steer for it, and proceed as before directed.

Between the Rock Head and Thrumcap. BETWEEN THE ROCK HEAD AND THRUMCAP.—If a N.E. wind, or other circumstances, should render preferable the passage between the Rock Head and Thrumcap Shoals, proceed as follows by night: Having made Sambro Island light as before, and passed Shut-in Island, steer so as to pass not less than half a mile, or more than one mile, to the Southward of the Red light on Devil Island, steering W. ½ S (made good), until the light on Maugher Beach bears North, when steer for it until abreast of the Thrumcap, or until Devil Island light bears E.S.E.; then change the course to N. by W., or as may be necessary, to avoid the light-house bank.

In the day-time, pass the light-house on Devil Island, steering W. ½ S., as before directed, or so as to keep Graham Head open South of Devil Island the whole breadth of the island, which mark will lead to the Southward of the Thrumcap Shoal and buoy; and when George Island opens out West of the light-house tower on Maugher Beach, bearing N. ½ W., steer for it, until abreast of the Thrumcap; then edge away to the Westward, keeping the light-house on Devil Island in sight, South of Macnab Island, and over the beaches between it and the Thrumcap (so as to clear the Light-house Bank), until the steeple of the R. C. chapel at Dartmouth comes in one with the East side of George Island, bearing North. These last-named marks kept in one, will lead clear of all dangers into the harbor.

In adverse winds, the Admiralty chart resulting from our survey, and the leading-marks herein given for clearing the dangers, will enable vessels to beat in or out without difficulty in clear weather.

TIDES.—The mean of two years' observations, with a self-registering tide-gauge at Halifax dock-yard, gives as follows, viz. :—High-water, full and change, (the true Establishment,) at 7h. 39m. ; ordinary springs rise 6 feet ; equinoctial springs 7 feet ; neap tides range to 3 feet or rise to 4 feet above the level of low-water springs. *Tides.*

The true Establishment (or time of high-water on the day when the sun and moon are on the meridian together) for the year 1852, was 7h. 36m. after the moon's transit. The vulgar Establishment, (or time of high-water on the full and change days,) 7h. 49m., being the mean of fifty inferior and superior, or a. m. and p. m. transits ; but the diurnal inequality, aided probably by winds, caused the vulgar Establishment to vary from 8h. 17m. to 7h. 20m. after the moon's transit.

The rise also is greatly influenced by the winds, Southerly winds causing high, and Northerly winds low tides ; and if the winds chance to act in accordance with the diurnal inequality, the rise of the morning and evening tides of the same day may differ to the amount of a foot, or even more in extreme cases. From the above-named causes, the rise of spring tides varies from 5 to 7 feet, and of neap tides from 4 to 5 feet above the ordinary low-water in spring tides. Extraordinary spring-tides, aided by strong Southerly winds, have risen 8 feet ; and extraordinary neap-tides only 3 feet above the average low-water in spring tides.

The ordinary rate of the tide-stream nowhere exceeds half a knot.

POSITION.—The position of the Observatory in Halifax dock-yard is in lat. 44° 39′ 37″ N., long. 63° 34′ 57″ W. of Greenwich. The variation in 1852 was 18° West. *Position.*

In proceeding along the coast to the Eastward of Halifax Harbor, the course and distance from Devil Island to Shut-in Island across the first bay Eastward of Halifax, is E. ½ S. 8 miles.

COLE HARBOR, in the bottom of this bay, has a dangerous bar of sand, over which only 3 feet can usually be carried at low-water, and which is covered with breakers whenever there is any sea running. It is only with fine weather and a smooth sea that boats can safely cross it to the entrance, which is barely 40 fathoms wide between points of shingle and sand. In this narrow entrance the depth is 5 fathoms, and the rate of the tide-stream from 1 to 2 knots ; but immediately within it the depth diminishes to 4 or 5 feet, and narrow channels between mud-flats extend 2 miles inland. *Cole Harbor.*

Two miles to the Eastward of this harbor is the low Egg Islet, joined to the shore by a reef and shingle beach, and having shoal water off it 3 cables to the Southward, where it terminates in 5 fathoms, nearly 1 mile out from the shore.

LAURENCETON LAKE.—The entrance of Laurenceton Lake, admitting boats only in fine weather, is half a mile further to the Eastward, and on the West side of Laurenceton Head. This is one of those peninsulas, composed of drift sand, clay, and boulders, resting on clay slate, and united to the shore by long beaches of stones or shingle, whose red cliffs form the distinguishing feature of this part of the coast. The peninsula is 92 feet high, and the kirk, which stands on its inner slope, is therefore not very conspicuous from the sea. *Laurenceton Lake.*

PORTER LAKE is 3 miles further to the Eastward, its entrance being on the Western side of Graham Head, which is another and similar peninsula, with red cliffs 60 feet high. The lake extends 7 miles to the Northward, and receives the waters of other lakes still further inland. It is in some parts 4 or 5 fathoms deep, but has only one foot at low-water in its narrow entrance. *Porter Lake.*

SHUT-IN ISLAND, 3 cables long, and of low clay-slate rock, is distant half a mile from Graham Head, but united to it by a reef and beach of shingle. It forms the Western side of the entrance to Three Fathoms Harbor. *Shut-in Island.*

THE SHUT-IN SHOALS extend 1⅓ mile to the Westward, and three-quarters of a mile to the Southward of the island. They are of rock, with 16 feet least water, and are extremely dangerous. The red cliffs of Seller Head open East of the Eastern point of entrance of Three Fathoms Harbor, bearing N.E. by N., will clear their S.E. point ; and Devil Island Red Light, when in sight, should not be brought further to the Westward than on a W. by N. ½ N. bearing. There is a depth of 20 fathoms water within a mile of them, and vessels should not approach nearer than that depth at night, or in foggy weather. *The Shut-in Shoals.*

THREE FATHOMS HARBOR is quite open to the Southward, and affords shelter only to small vessels, that can run in to the narrow channel to the Eastward of Ball Islet, one mile within the entrance. The depth is 3 fathoms, over muddy bottom ; but to reach it, the low-water depth of 8 feet (with a 4½ feet rise) must be passed over. The entrance to this harbor, between reefs that partly dry at low-water, is half a cable wide from 3 fathoms to 3 fathoms on either side, and the depth is 22 feet, but it decreases to 8 feet a short distance within, as already indicated. It is an excellent fishing station, but is of no use to shipping, excepting as a harbor of refuge *Three Fathoms Harbor.*

in case of distress, when a vessel might run in until she grounded on the mud within the reefs. The leading-mark for running in is, the West side of Ball Islet, and a white house on a hill at the head of the harbor in one, bearing N. ¼ W.

HALIFAX, WESTWARD.

Remarks. 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, 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.

Prospect Harbor. PROSPECT HARBOR lies about 3 miles to the N.W. of Cape Prospect, or Mars Head, 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; 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. 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 on-shore 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. 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. 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. 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 the Indian Harbor is Hagget's Cove, distant one mile, a cove or harbor of similar description. Luke's Island, Thrumcap, 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.

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 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.

HEAD HARBOR, OR DELAWARE RIVER, lies at the further end, on the North-eastern 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 sheepfolds. The land on the port side of the entrance to the Head Harbor is 446 feet high.

Ingram River.

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 Gasper'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.

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 port 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 6 feet water, which lies close in to the land.

North-west Harbor.

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.

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.

Horse Shoe, or Dog Rock.

THE HORSE-SHOE, or DOG ROCK, lies about South, distant one mile and a half from the 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.

Iron-bound Island. IRON-BOUND ISLAND.—W.S.W. ½ S. from the South point of South-west Island, distant 5 miles, is Iron-bound 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. GREEN ISLAND.—S. ½ E., distant one league from Iron-bound 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 Iron-bound 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 againt the probable existence of such a danger; there is otherwise water sufficiently deep for any vessel.

Mahone Bay. 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 Iron-bound 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 are 4 feet water, and round it are 4½, 5, and 7 fathoms.

Flat Island lies due West from Iron-bound Island, distant one mile and a quarter; and in a similar direction from Flat Island, somewhere about one mile off, lies the Bull Rock, 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 Iron-bound 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 Iron-bound Island, will lead to the Northward of it; and Chester Church open of Great Tancook Island, will carry you 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 six 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 over 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 Iron-bound 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 port 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 port 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 Iron-bound and Flat Islands, both steep to, is 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.

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.

Light-house

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 Ovens 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 Ovens 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 equidistant 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. ½ 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 Ovens 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.

High-water.

Dartmouth Bay.

DARTMOUTH BAY.—This is situated between Ovens 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 Iron-bound Island at the entrance to Le Have River, the shores are bold, and much indented with irregular inlets or bays. Iron-bound Island lies about W.S.W. ½ S., distant nearly two leagues from Cross Island. It is inhabited, and some small rocky islets surround its Northern shore: S.E. ½ E., 1½ 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.

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. ¾ 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 there are only 4 fathoms. W. by S., distant 3½ 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 Iron-bound Island, but it is narrow, and to navigate this, you must give the Iron-bound 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 Iron-bound 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 Iron-bound 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.

Light.

On the Southern side of Iron-bound Island, there is a light-house; it is a square white tower, the lantern is 70 feet above high-water mark; the light flashes once in 30 seconds.

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 3½ miles from Cape Le Have.

Port Metway.

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. ½ 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 three-quarters 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, towards Kempenfelt Head, you will open the channel, and may steer in directly North. Or, you will avoid the South-west Ledge and Stone Horse Rock, 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. *Light-house.*

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 7. *Tide.*

Tides.

At Cape Le Have it is high-water, full and change, at 8 o'clock, tide rises from 5 to 7 ft.

Malaguash Bay	6 to 8
Green Island	6 to 8
Mahone Bay	7

Liverpool Bay. 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, 80 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 and a half mile 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 or 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 W. 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 South-westerly, and you can anchor, in not less than two fathoms, opposite the town of Liverpool. Herring Bay is much exposed to the heavy South-easterly swells of the sea, and has not room for more than two sloops of war. *Light-house.*

On Fort Point there is a fixed light in a square white tower, 30 feet high. *Light.*

It is high-water in Liverpool Bay, full and change, at 50 minutes after 7, and the tides rise from 5 to 8 feet. *Tides.*

Port Matoon, or Mouton. 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 2¼ fathoms near its outer extremity. Over some parts of this shoal you will have 3, 3½, and 4 fathoms. Here also is a small spot of foul ground with 20 feet over it; this lies N.N.W. ¼ W. from

the N.W. end of Mouton Island, and N.E. ½ E. from the Northern Spectacle 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. ½ 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. ¾ 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, or Mouton Island, or round the Spectacles.

The land now turns S.W ¾ W. from Point Mouton towards Port Jolie; midway is a black craggy point, with several rocks about it. S. ½ E., distant 2½ 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 2 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 South-westward, called the Little or Lesser Hope.

Port L'Ebert. 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 South-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. SABLE RIVER lies to the South-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. of Green Island, distant 3½ 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. 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 4½ 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 land 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 6¾ 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 Rock, distant one mile, is the Blow Breaker, a rock with only 4 feet over it. This appears to be the Tiger 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 look-out for the Blow, or Tiger 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 port 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, Centre 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. On the Gull Rock there is a fixed light, 51 feet high. 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. *Light. High-water.*

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 3 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. *Green Harbor.*

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'Nutt's, 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 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 100 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 South-west of Rugged Island W.N.W. ¼ W., 8 miles; and from the Jigg Rock, which has only 6 feet 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. *Shelburne Harbor. Light-house.*

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 wharfs; 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 South-east commonly brings on high-water sooner, and causes an additional rise of 2 or 3 feet.

High-water.

Cape Negro Harbor.

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 Rock 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 intricate, encumbered with rocks and dangers, and should not be attempted except in cases of extreme emergency. Mr. Des Barres says, "if coming from the Westward, in hauling round Point Jeffrey, 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 3 cables' length, until you open David'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 above. 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.

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. "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 2 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 sunken rock, within which and the Western shore is a channel of 6 fathoms. The Vulture, a dangerous breaker, lies W.S.W. ½ S., 1¾ mile 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 3 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 water 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 ebb-tide 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. *Barrington Bay.*

On Baccarro Point, the Eastern side of the entrance, there is a flash light of 15 seconds' duration, with eclipses of 25 seconds from it. Cape Sable bears S. 77° W., distant 7¼ miles; Brazil Rock, S. 4° 10′ W., distant 5½ miles; Bantan Rock, S. 45° W., distant 1¼ mile. *Light.*

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. ½ S. from Baccarro Point, distant 1¾ mile; the Bantan bears S.W. from the point 1¼ mile, 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, 13, and 20 fathoms, rocky ground. *Cape Sable.*

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. *High-water.*

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. *Bonnetta Cove.*

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 high-water, full and change, at 9 o'clock, spring-tides 11 feet, neaps 8. *Favorite Cove.* *High-water.*

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 to 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. Brazil Rock bears from Baccarro Point light S. 4° 10′ W., distant 5½ miles: its latitude is 43° 24′ 15″ N., and longitude 65° 22′ W. *Brazil Rock.*

Magnetic Bearings and Distances between Halifax and Cape Sable.

From Sambro light-house to Cross Island, Lunenburg, nearly W.		8½	leagues.
——— Cape Le 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. ½ 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. ½ E.	8½	do.

THE ISLE OF SABLE AND BANKS OF NOVA SCOTIA.

The dry part of this island is 22 miles long, and the bars at each end nearly 30 miles, making a bow or crescent of 52 miles in length. Caught within the horns of this crescent in a strong Northerly gale, the situation of a vessel would be extremely perilous; for the ebb-tide sets to the Southward, directly on and over the bars, usually at the rate of 1½ and 2 knots, and when accelerated by winds much faster; whilst the flood-stream runs at a much less rate in the opposite direction.

Bars. The whole extent of the North-west bar, from the end of the Grassy Sand-hills to the depth of 10 fathoms, is nearly seventeen miles; the dry part being succeeded by nine miles of foaming breakers in bad weather, and the remaining seven miles, from five to ten fathoms of depth, being usually shown by a great ripple, or a heavy cross sea.

The direction of this bar is N.W. ½ N. magnetic, for the first twelve miles, then W. by N. for the remaining distance; beyond which the water deepens gradually to the Westward for many miles.

The North-east bar extends fourteen miles out from the Grassy Sand-hills to the depth of ten fathoms. Its direction is N.E. by E. ½ E., for the first seven miles, beyond which it curves gradually till it terminates to E.S.E.

The dry part of nearly four miles is succeeded by eight or nine miles of breakers, when there is any sea running. I have considered this bar as ending at the depth of ten fathoms, but the ridge of sand continues, with a depth of from ten to thirteen fathoms, and often a heavy breaking sea, ten miles further to E.S.E., and then ends abruptly; the soundings increasing to 170 fathoms, in a distance of three miles further in the same direction.

Both bars are extremely steep, and consequently dangerous of approach on the North side; the North-east bar, especially so, having thirty fathoms of water close to it. To the Southward, on the contrary, the water deepens gradually out for so many miles, that it would seem almost impossible for any vessel, using common precaution, to run on shore on that side, either of the island or bars.

Lat and Lon. The West Flagstaff near the principal establishment is in lat. N. 43° 56′ 32″, long. W. 60° 3′ 19″. The West extreme of the Grassy Sand-hills, lat. N. 43° 56′ 52″, long. W. 60° 09′.

N.E. extreme of the Grassy Sand-hills is in lat. N. 43° 59′ 05″, long. W. 59° 46′ 0.15″.

Tides. Tides.—It is high-water, at full and change, at 7h. 30m. nearly, on the North side of the island; rise not exceeding four feet. On the South side it is high-water a little earlier, perhaps an hour The opinion of the people on the island is that anything floating in the vicinity of the island is sure to be found on the beach sooner or later. (Capt. H. W. Bayfield, R. N.)

Extract of a Letter from Capt. Joseph Darby, Superintendent 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

* This course cannot be sailed, upon account of the intervention of the land.

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 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 is 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, 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 3 miles, from whence shoal water, that always breaks, extends about 2 miles further, in an E.N.E. direction, outside of which, for a distance of about 6 miles, is a passage across the bar, with from 2½ to 3 fathoms of water on 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 of 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 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 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 and 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 lies 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 gov-

crew at, 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 he 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 authorized 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:

Directions. 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.

Ice. If breakers are seen to the Southward ahead, and extending from East to West, you are on the North side of the island.

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., long. 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 smaller 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, *Soundings.* 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.

Soundings. 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 and Mecklenburgh 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 shore; but on approaching nearer, the weather is found more clear: and with the wind from the land, it is perfectly clear and pleasant.

BETWEEN CAPE SABLE AND SEAL ISLAND.

SEAL ISLAND is low and thickly wooded, with a light-house on its South end, exhibiting a fixed light, 98 feet above high-water. *Seal Island.*

The dangers off it are:—

PURDY ROCK bears from the light-house S.E. by E. ½ E., rather more than 2 miles distant; it is of very small extent, and has only 14 feet on its shoalest part and deep water all round, but it shows a tide-rip during the strength of the tide, and breaks in heavy weather. *Purdy Rock.*

THE BLONDE ROCK, which bears from the light-house S. ¾ E., distant 3¼ miles, uncovers about 2 feet above low-water springs; it generally breaks, and can be passed to the Southward at a quarter of a mile distant. There is also a rock, with only 14 feet on it, the eighth of a mile to the Southward. About a mile to the Westward of the Blonde, there is a heavy breaking tide-rip during the strength of the tide, but the Columbia carried good water through it. *Blonde Rock.*

THE ELBOW SHOAL lies between the Blonde and Seal Island; it is of some extent, and has a rock on it called the Elbow, with only 5 feet on its shoalest part at low-water, which bears from the light-house about S. by W., distant 1½ mile: the Eastern tangent of Seal Island on with the rock off its South point, leads to the rock. There is a heavy tide-rip over the shoal during the strength of the tide. *Elbow Shoal.*

THE ZETLAND SHOAL, so called from a vessel of that name striking on it, and reported one small rock with only 17 feet water over it; not less than 21 feet at low-water was found on it, which bears from the light-house S.W. ¾ S., nearly 2 miles. The shoal breaks in heavy weather and shows a tide-rip during the tide. *Zetland Shoal.*

THE DEVIL'S LIMB is a small rock, about 10 feet above high-water springs, bearing from the light-house N.W. ½ W., distant 1¼ mile. At about a quarter of a mile to the Southward of the rock is a small detached shoal, which just uncovers at low springs, called the Loch Foyne, from a ship of that name which was wrecked on it; the passage between the Devil's Limb and Seal Island should only be used by those well acquainted with it. *Devil's Limb.*

THE LIMB'S LIMB, which lies upwards of half a mile to the Northward of the Devil's Limb, is small, with deep water close outside of it, and shows itself one hour after high-water; the Columbia mail steamer was wrecked on it. *Limb's Limb.*

Between the Limb's Limb and Crowell beach on Seal Island there is anchorage in 5 fathoms, over sandy bottom, and safe with all winds, except those between North and West.

THE MUD ISLANDS lie to the Northward of Seal Island, and consist of 4 small islands, namely, Noddy, Mud, Round, and Flat; they all may be approached on their Eastern side, except the former, to which a berth should be given of half a mile, as many rocks lie off it within that distance. A shoal runs off about a third of a mile from the Northern end of Flat Island, and shows a heavy tide-rip during the strength of the tide. There is a good channel between Noddy, the Southernmost of these islands, and Seal Island; mid-channel is to be recommended to vessels passing through it, but in foggy or thick weather Seal Island's side is the best to make. About a third of the way across the channel from Noddy Island is a shoal on which Lockwood states are only 18 feet water; the least water that could be found on it was 5¼ fathoms, and it shows a tide-rip during the strength of the tide. The tide-stream sets strong through this channel, at a rate of about 4 knots per hour during its strength, in about a N.W. and S.E. direction. In fogs, however, it is better to go to the Southward of Seal Island and the Blonde Rock. *Mud Islands.*

BLACK LEDGE lies to the Westward of Mud Island, and to the Southward of Flat Island, and bears from the centre of Noddy Island N.W. ¾ N., distant 1½ mile; it is always visible, except at high-water springs, when it generally breaks. *Black Ledge.*

THE SOLDIER'S LEDGE uncovers about 2 hours after high-water, and is very dangerous, but it generally breaks when covered. It bears from the North end of Flat Island about N.W. ¾ N., distant 2¼ miles. There is a passage between this ledge and Flat Island, but it had better not be used. This shoal is improperly laid down by Lockwood, and agrees nearly in position with the Acteon of Des Barres. *Soldier's Ledge.*

Mud Island, West Shoal. MUD ISLAND, WEST SHOAL.—To the Westward of Mud Island lies a shoal with only 24 feet on it at low-water springs, but it shows a tide-rip during the strength of the tide, and is said by people on Seal Island to break in very heavy weather. It should, however, be avoided by vessels of large draught, because, the bottom being very irregular, it is highly probable that the least water has not been obtained. The 24 feet bears from the light-house on Seal Island nearly North 5 miles, the light-house showing just open to the Westward of Division Point, and from the centre of Noddy Island N.W. by W. ½ W. 2½ miles. In running between Noddy and Seal Islands, the South side of this shoal should be passed.

The soundings between the Seal and Mud Islands and the main are irregular, varying from 22 to 6 fathoms water; the shoal patches show a tide-rip during the strength of the tide.

Stoddart Cove. STODDART COVE.—From Bear Point to Stoddart Island is a bay full of rocks and ledges. This bay and the South point of Stoddart Island require a good berth. To the Northward of Stoddart Island is Stoddart Cove, which affords good anchorage in all weather for vessels of not more than 9 feet draught. The best entrance is the Western, keeping the island on board to avoid a rock off the Northern point of the entrance, which just uncovers at low-water springs, and has good water around it. It lies about a sixth of a mile from the point, and about half way between it and the shore is another rock, which shows at half tide.

Shag Harbor. SHAG HARBOR lies between Bon Portage or Shag Harbor Island and the main, and affords anchorage for vessels of good draught with all but strong Southerly winds.

Cockerwit Passage. COCKERWIT PASSAGE.—At the entrance of Cockerwit or Woods Harbor, and between it and the Mutton Islands, there is good anchorage in from 5 to 5½ fathoms at low-water, over a muddy bottom. In the passage to this anchorage there is a rock to to be avoided, which just uncovers at very low springs, and has deep water close to it. Robinson's Ball station (built of stone) on with the centre of Little Stony Island, leads right on it; and in running up, a house standing on the Northern end of Stoddart Island just open to the Eastward of a detached rock off Prospect Point, clears it to the Eastward. Cockerwit Passage cano nly be used by vessels of small draught from 8 to 9 feet water, and steered by experienced persons.

The passage to the Northward of Bon Portage Island, between it and Robinson's Ball, can only be used by small vessels.

St John Ledge. ST. JOHN LEDGE is a dangerous shoal, which generally shows itself except at very high springs. It bears from the South-west point of St. John Island, S. by W. ½ W., 1½ mile. Pubnico light-house open to the Westward of the island, bearing N.E. by N., leads to the Westward of the ledge.

Pubnico Harbor Light-house. PUBNICO HARBOR.—A light-house has been erected on Beach Point, the Eastern side of the entrance to Pubnico Harbor, in the shape of the frustum of a pyramid on a square base, and exhibits a fixed red light, at about 28 feet above high-water. On entering this harbor, care must be taken not to pass St. Ann Point, on the Western side of the entrance, nearer than a quarter of a mile. Beach Point, a low shingle point on the Eastern side, has good water, and may be passed pretty close. A long ledge, which uncovers at low-water, runs off the Western side of the harbor, nearly abreast of Beach Point; a buoy is placed at its Eastern extremity, and should be passed at about half a cable's length to the Westward. After passing the buoy, haul a little more to the Westward, steering towards the church, which is a conspicuous object on the Western shore of the harbor, to clear a shoal which lies off the Eastern shore, and on which were found only 11 feet at low-water; the bottom is, however, so peaked and uneven, that it is possible there may be less than that given by the lead. A good mark for clearing the ledge off the Western shore, after rounding Beach Point, in case the buoy should not be seen, is the point to Southward of Beach Point, seen over the high-water line of Beach Point; this will also clear the ledge on the Eastern side before mentioned, but will lead rather close to it.

Vessels had better not proceed further than the two Southernmost wharves, unless under charge of a good pilot; off these there is good anchorage in 9 or 10 fathoms over muddy bottom, a little nearer the Western than the Eastern side of the harbor. The lead will give the best information at high-water when everything is covered, and which is the most difficult time to enter; but at low-water, when everything shows itself, the banks of the channel point out the anchorage.

A spring of fresh water close to the Southernmost wharf affords about four tons of very good water daily.

Directions. DIRECTIONS.—Cape Sable bearing North 2 miles, a W. by N. course 16 miles, will lead a mile to the Southward of the Blonde Rock.

To pass between Seal and Mud Islands, keep the extremity of Cape Sable to the Northward of E. by N. ¼ N. until Green Island bears N. by E. ½ E., this will clear the S.W. ledges; then haul up N.W. by W. 16 miles, which will lead through the channel about midway.

To pass to the Northward of the Mud Islands and to the Southward of the Bald Tusket, when clear of the S.W. ledges, haul up N.W. ¾ N. 17 miles, and when Round Island bears S. by W. ½ W., the vessel will be in the fairway.

If bound for Pubnico Harbor, haul up N.N.W. ¼ W. 10½ miles, when St. John Ledge will be on the starboard beam, distant 1½ miles, and the harbor will open out to the Westward of St. John Island, and may be run for, that island being bold to; Beach Point (the Eastern point of the entrance) must be passed close to.

AT NIGHT, Pubnico light, open to the Westward of St. John Island, bearing N.E. by N., leads to the Westward of St. John ledge, and the light may be steered for on that bearing by vessels running for the harbor, giving the island a berth of a cable's length, and rounding the light-house at the same distance; when the light bears S.S.W., steer N.N.E. In running for the harbor from any other direction, the light must be brought to bear to the Northward of E.N.E. before it can be steered for, to avoid the shoal off St. Ann Point. *At Night.*

When the Blonde Rock is in sight, and the vessel bound to the Northward, Flat Island just open to the Eastward of Seal Island, will lead between the Blonde Rock and the Elbow.

TIDES.—The tide-stream between Cape Sable and Seal Island sets about N.W. by N. at flood, and S.E. by S. at ebb, from 2 to 3 knots per hour; a due allowance on the above courses must therefore be applied to determine that which ought to be steered. The direction and rate of the stream becomes much modified when near the land. Through the channel between the Seal and Mud Islands it sets N.W. and S.E., nearly 4 knots per hour. *Tides.*

The tide-stream sets very strong round Seal Island, and except at slack water there are heavy tide-rips over the shoal ground to the Eastward of the island, which may, however, be approached. The tide commences running along shore to the Northward at half ebb, and continues so to run until high-water.

BETWEEN PUBNICO AND TUSKET ISLANDS.

ST. ANN SHOAL.—A shoal, with 16 feet at low springs, rocky bottom, called St. Ann Shoal, bears from St. Ann Point N.W. ¼ W. 1¾ mile, and from the South Twin S.W. ½ S. 1½ mile, and shows a tide-rip during the strength of the tide. *St. Ann Shoal.*

THE TWINS are two small islands lying about half a mile from the shore, from which they are separated by a channel with more than 5 fathoms in it at low-water, and between them is a channel of similar depth; they can be approached pretty close. There are two dangers off the Northern Twin, one bearing N.W. by W. $\frac{3}{10}$ of a mile, with 16 feet on it at low-water springs, and the other bearing N. ½ W. a third of a mile, with 8 feet; they are both of small extent, and carry good water close to. *The Twins.*

ARGYLE lies to the Northward, and has several good anchorages, but the channels to them are too intricate to be entered without a good pilot. *Argyle.*

WHITE HEAD ISLAND is rendered conspicuous by earthy cliffs of a reddish-gray color, nearly 70 feet in height, which form its boundary to the South-west. It can be safely approached on all sides except the Northern to a quarter of a mile. *White Head Island.*

WHITE HEAD LEDGE bears from the South end of White Head Island E. ¼ S., distant three-quarters of a mile. It uncovers at low-water, round which part it is shoal for about a cable's length. After half ebb, the kelp marks the position of this ledge. *White Head Ledge.*

WHITE HEAD WEST SHOAL bears from the South end of White Head Island N.W. half a mile. It has only 13 feet on it over a rocky bottom, at low springs. *White Head West Shoal.*

JONES LEDGE dries about one hour before low-water in one spot, but the kelp shows at half-tide; it bears from the South extreme of Jones Island S. by W. ½ W. three-eighths of a mile. *Jones Ledge.*

JONES ANCHORAGE.—In case of distress, Jones Anchorage may be entered as follows: Steer for White Head Island, and run along its Eastern side, steering about N. by E. ½ E., at a distance of not less than a quarter of a mile, and not greater than half a mile from it; this will avoid White Head Ledge, leaving it to the Eastward. Immediately to the Northward of White Head Island lies Pumpkin Island, which is bold to on the Eastern side, and must be left to the Westward at not more than a third nor less than a quarter of a mile; this will avoid Pumpkin Ledge, which has only 2 feet water on it at low springs, and which bears from the South end of Pumpkin Island E. ¾ S., half a mile; at hal-febb the kelp marks its position. *Jones Anchorage.*

When abreast of the Northern end of Pumpkin Island, alter course to N. by W. ½ W., and run for mid-channel between Jones Island and the Thrum; and when abreast of the latter, run along Jones Island from about one or two cables' length distant; good anchorage in 6 fathoms, mud, will be found, at 1½ cable from the shore.

To run in on the Western side of White Head Island, proceed as follows: Steer for the South end of White Head Island, and pass it at not more than 3 cables' nor less than one cable's length distant; this will avoid White Head West Shoal, passing between it and the island. Then run along Pumpkin Island, but not nearer than a quarter of a mile; and when it bears E. by S. ½ S., take care to open the Western side of Hog Island with the Eastern side of Jones Island; this will clear Jones Ledge. Then run along the Eastern side of Jones Island, and anchor as above.

Gull Island. GULL ISLAND.—To the Westward of White Head Island lies a small low green island called Gull Island, which may be approached on the Southern side to about half a mile; the bay between it and White Head Island should not be entered without a good pilot, especially at high-water, when the dangers are covered.

Gull Ledge. GULL LEDGE.—To the Southward of Gull Island lies the Gull Ledge, which has only 5 feet on its shoalest part at low-water springs. The large barn on Sheep or Wilson Island on with the Western high-water mark of the Gull, leads right on the shoalest part, distant 2 miles.

S.W. Shoal. S.W. SHOAL.—To the South-west of Gull Island is a small shoal with only 15 feet on it at low springs. It is distant from Gull Island about a mile, in the direction of Pumpkin Island on with Gull Island.

There is good anchorage all the way in mid-channel between Hog and Jones Island, but it is not recommended for a vessel to pass beyond Hog Island without a pilot. There are no regular pilots, and the fishermen are not used to carry vessels of any size through those passages, and therefore cannot be trusted with a vessel of more than 6 or 8 feet draught.

Tusket River Entrance. Eastern Passage. TUSKET RIVER ENTRANCE.—EASTERN PASSAGE.—Between Gull and Sheep Islands there is a rock which uncovers at half-tide, and between the former and Eastern Bar Island there is a rocky patch with only 4 feet on it at low-water springs; hence the Eastern passage into Tusket River should not be attempted, except by persons well acquainted with it. The passage between Eastern Bar Island and the Fish Islands is obstructed by Fish Ledge, which uncovers at half-tide, and which bears from the Southern point of Eastern Bar Island N. ¼ W., half a mile, and from Little Fish Island, S. by E. ½ E., half a mile. The East tangent of Tucker Island on with the inner Fish Island, leads over the ledge, and when open to the Westward, clears it.

Western Passage. WESTERN PASSAGE.—To enter Tusket River by the Western passage (which is to be recommended when coming from the Southward, and clear of Gull Ledge, steer N. by W. ¾ W. for Western Bar Island, until Tucker Island opens to the Westward of inner Fish Island (which clears Fish Ledge to the Westward); then steer N. ¾ E. for Big Fish Island, passing Little Fish Island, which is bold to, at about a quarter of a mile to the Westward. The course should then be altered a little to pass Big Fish Island to the Westward, at from one to 1½ cable distant, taking care not to exceed the latter distance, in order to avoid Big Fish Rocks, which lie N.W. by W. ½ W., 2 cables' length from the North end of Big Fish Island, and just uncover at low springs; the large barn on Sheep Island a little open of the North tangent of Big Fish Island, and the high-water tangents of the South points of Eastern Bar and Big Fish Islands in line, lead over these rocks.

From thence steer N. by E. ½ E., and give Tucker Island a berth of from one to two cables' length, passing to the Westward of it; take care not to exceed the latter distance to avoid Tucker Island Ledge, which has only 5 feet on it at low-water springs, and bears from the North end of Tucker Island N.W. by W. ½ W., 2½ cables' length. After passing Tucker Island, steer about N. by E. ¾ E., for Pinch Gut Island, which may be passed to the Westward at a cable's length; care must, however, be taken not to incline too suddenly to the Eastward, as a shoal bank of mud runs off the North end of Tucker Island, having only 12 feet on it at low-water springs, and at 3 cables' distance from that end of the island there will be equal danger by inclining to the Westward, from a mud-flat which runs off a considerable distance along the Western shore, commencing just above Tucker Island. To the Southward of this, the Western shore is very ragged and shoal, which is the reason for keeping the islands (whose Western shores are bold) aboard. There is sufficient room for a good pilot to turn a vessel of 12 feet draught in or out of the river with the tide. Big Fish Rocks having deep water all round them, a buoy would greatly facilitate the navigation, when they might be passed on either side.

One mile above Pinch Gut Island is Half-tide Rock, which lies a third of the way across from the high line of the Eastern shore towards that of the Western. The deep-water channel is to the East of this rock.

Anchorage. ANCHORAGE.—Good anchorage over mud bottom can be obtained anywhere between Tucker Island and Half-tide Rock, beyond which it is strongly recommended for no vessel of any draught to attempt going without a very experienced pilot and a

ading wind, because the channel is very intricate, and the tide rapid. In the Narows, by Plymouth, the stream at half-tide springs runs about 5 knots per hour, and breast of Pinch Gut Island about 2 knots.

When bound out of Tusket River and proceeding to the Westward, being abreast ittle Fish Island, steer S.S.W. ½ W., taking care not to bring Western Bar Island bear to the Eastward of N. by E. ½ E., until the South point of Spectacle Island pens to the Southward of Peases Island, when the course may be altered to the Westward. This will clear the Old Woman, a rock which uncovers at about two ours' ebb, and bears from the South end of Western Bar Island about S.S.W., distant ¾ miles, and from the South point of Bald Tusket Island N.E. by E., 3 miles. A ng piece of shoal broken ground runs from the Old Woman towards Western Bar land.

Before carrying a vessel through the passages between Round Island, the Tuskets nd the main, we will describe the principal dangers in the neighborhood.

The Old Man.

THE OLD MAN uncovers about one hour before low-water springs, at which me it is about 2 or 3 feet above water, with some straggling rocks just uncovered, ttending to the Northward of it about the eighth of a mile. The large rock bears om the Bald Tusket about N.E. by E. ¾ E., a little better than a mile. Owls Head pen to the Eastward of Allen Island, clears the Old Man to the Eastward; and the orth end of Half Bald Tusket Island open to the Northward of Little Bald Tusket land, clears it to the Northward.

Little Bald Tusket Ledge.

LITTLE BALD TUSKET LEDGE lies between the Old Man and Little Bald usket Island, from which it bears about E.S.E., distant half a mile, and has 9 feet its shoalest part at low-water. The North end of Half Bald Tusket on with the orth end of Little Bald Tusket, leads right on the 9 feet; and Owls Head open to astward of Allen Island, clears it well to the Eastward.

Harriet Ledge.

HARRIET LEDGE covers at a third flood, and bears from Bald Tusket Island N.W. ¾ W. nearly a mile, and from the Southern point of Half-Bald Tusket Island W. by S., distant half a mile. Holmes Island just open to the Eastward of Spectacle Island, and the South point of Peases Island just touching the North point of ittle Half Bald Tusket Island, lead right over this ledge, which shows a considerable de-rip when covered during the run of the tide.

Cleopatra Shoal.

CLEOPATRA SHOAL bears from the South point of Bald Tusket Island S. by , distant 1¾ mile, and is rocky and uneven, having only 12 feet on its shoalest part, here a few long pieces of kelp show at low springs. It has deep water all round and shows a considerable tide-rip during the run of the tide. Half Bald Tusket land open to the Eastward of the Bald Tusket, clears it to the Eastward; and open the Westward, clears it to the Westward.

Between the Cleopatra Shoal and the Bald Tusket are two small shoals, one with feet and the other with 19, at low-water springs, which show a tide-rip during the of the tide. There is a good passage between them and the Bald Tusket.

Peases Island Ledge.

PEASES ISLAND LEDGE covers at a third flood, and lies nearly mid-channel tween Peases Island and the main, at a quarter of a mile distant from the former. cKinnon's barn on Ellenwood Island, just touching the N.E. point of Peases land, clears it to the Westward, and leads between it and Peases Island; and the uth point of Spectacle Island just open to the Southward of the South point of ases Island, clears it to the Southward.

Marks Island Ledge.

MARKS ISLAND LEDGE just uncovers at low-water springs, and lies 1½ cable's ngth off the Western side of Mark Island. It shows a considerable tide-rip during e tide, which runs over it with great rapidity.

Allen Rock.

ALLEN ROCK lies off the South end of Allen Island, at 1½ cable's length distant, the direction of Peases Island; it has good water all round it, and shows a whirl the strength of the tide. The barn on Ellenwood Island open of the South-west d of Allen Island, clears it to the South-westward.

Schooner Passage Rock.

SCHOONER PASSAGE ROCK lies nearly mid-channel between Owls Head d Turpentine Island, and has 10 feet on it at low-water springs, and deep water all and. Bird Rock, just open to the Southward of Owls Head Island, leads over it.

Bird Rock.

BIRD ROCK lies in Ellenwood Passage, nearly mid-channel between Ellenwood and and Owls Head Island. It always shows, being about 2 feet above water at gh springs.

Spectacle Ledge.

SPECTACLE LEDGE has 11 feet on it at low-water springs, and shows a large e-rip during the strength of the tide. It bears from the South end of Spectacle and S.S.W. three-quarters of a mile, and from the North end of Half Bald Tusket ut W. by S. ¼ S., a good mile. The South point of Peases Island just overlapping Northern point of Half Bald Tusket Island, clears the ledge to the Southward; the cliff on the S.W. end of Ellenwood Island open of the Eastern tangent of ectacle Island, leads clear to the Eastward. It runs in this direction, being very row.

Schooner Passage. SCHOONER PASSAGE.—To run through Schooner Passage, keep Owls Head open to the Eastward of Allen Island until Half Bald Tusket Island opens to the Northward of Little Bald Tusket Island, taking care to keep the South point of Spectacle Island open to the Southward of the South point of Peases Island until McKinnon's barn on the North end of Ellenwood Island touches the N.E. tangent of Peases Island; this leads clear to the Westward of Peases Island Ledge, which must be rounded close to on the flood-tide, which sets strong on the South point of Peases Island. Keep about mid-channel, taking care not to approach the Eastern side, to avoid Haymaker Ledge Shoal, which lies off the South end of Haymaker Island, with only 2 feet on it at low-water, and which will be cleared by keeping Candle-box Island open to the Westward of Haymaker Island. After passing Allen Island, take care not to open the S.E. tangent of Murder Island to the Eastward of Candle-box Island, in order to pass to the Westward of Schooner Passage Rock. Keep midway between Owls Head and Candle-box Island, and run along the Western side of Murder Island, which may be approached to about 2 cables' length on its S.W. side.

Anchorage. ANCHORAGE.—Good anchorage will be found off the North end of Allen Island. In this passage the tide runs with great rapidity, about 3 knots an hour, in its strength.

Ellenwood Passage. ELLENWOOD PASSAGE.—After passing Peases Island Ledge, keep McKinnon's barn open to the Southward of Allen Island; this clears Allen Rock, passing to the Southward of it. Run in mid-channel between Mark and Allen Islands, and mid-channel between the Bird Rock and Ellenwood Island; and after passing the rock a cable's length, get it on the Eastern tangent of Mark Island, which will clear the shoal ground which lies on either side of the passage. Murder Island can be passed on its S.W. side at 2 cables' distance.

Anchorage. ANCHORAGE.—Through the North entrance to this passage, off the North-eastern point of Ellenwood Island, the tide runs 4 knots an hour. There is good anchorage off McKinnon's house, about 1½ cable to the Northward of the Bird Rock.

To approach Ellenwood anchorage from the S.W., keep the cliff on the South-western point of Ellenwood Island open to the Eastward of Spectacle Island, taking care not to open Holmes Island until the Harriet Ledge is passed; this will clear Spectacle Ledge, passing to the Eastward of it. Keep Bald Tusket Island entirely open of the West end of Half Bald Tusket Island until the South Point of Allen Island opens to the Northward of the North point of Mark Island; this clears Mark Island Ledge, passing to the Westward of it. Then keep in mid-channel between Mark and Ellenwood Islands, giving the Southern point of the latter (which runs out shoal) a good berth; hence proceed to the anchorage as before.

Tides. TIDES.—The tide runs very rapidly through the Tusket Island passages, and the tide-rips thrown up by it are numerous and heavy. Its general set is to the North-west and South-east, but this is modified by the position and shape of the islands, which form considerable eddies, and by the main-land in the vicinity, of which the tide follows its direction. The average rate is from two to four knots per hour, and round some points its rate probably exceeds the latter. The tide turns a little after high and low water respectively. The establishment, or the times of high-water, at full and change, at the port at Ellenwood Island, is 9h. 47m.

Directions. DIRECTIONS.—To pass between Round Island and the Bald Tusket, having cleared Cape Ledge, steer N.W. ¾ N., which will lead clear to the Eastward and Northward of Round Island, and midway between the Cleopatra Shoal and the Soldier's Ledge, which must be carefully avoided. When the South-eastern extreme of Frenchman's Point opens to the Northward of Bald Tusket Island, a vessel will be clear to the Westward of the Soldier's Ledge, and the course must be altered to W.N.W. to pass to the Southward of Gannet Dry Ledge, and to the Northward of the South Ledge and S.W. Shoal, which lie much in the way, and must be carefully avoided by vessels of large draught. When the Gannet bears N.E. by E., the Dry Ledge is passed, and the course may be altered to the Northward. When the Dry Ledge is seen, it may be safely approached to within half a mile, as it has good water all round it.

Gannet Rock. GANNET ROCK.—The Gannet is a remarkable rock, the sugar-loaf peak of which is 50 feet above high-water, and the lump to the Northward of it has only 7 feet less elevation. Yarmouth or Cape Fourchu light-house bears from the peak N. by E. ¼ E., and Seal Island light-house S. ½ E.; they are both in sight in clear weather. The rock is about three-eighths of a mile long in a Northerly direction, and narrow, having deep water all round, except on its Southern side. The variation of the compass is 2° less Westerly on Gannet peak than in the neighborhood, being there only 14° W.

North Rock. NORTH ROCK bears from Gannet Peak about N. ¼ E., 3 cables distant. It uncovers at a third ebb, and generally breaks when covered.

SOUTH-EAST ROCK bears from Gannet Peak S. by E. ¼ E., distant nearly 1½ mile, and shows two breaks in heavy weather, and a good tide-rip during the tide. It has good water to a cable's length on its East and West sides. Yarmouth light-house, touching the Eastern tangent of Green Island, leads over it. *South-east Rock.*

SOUTH LEDGE bears from the Gannet Peak nearly South, distant 4½ miles; the least water found on it was 24 feet at low springs; it shows a tide-rip, and breaks in very heavy weather. The outer high lump of Cape Fourchu, just open of the East tangent of Green Island, leads over this ledge. *South Ledge.*

SOUTH ROCK bears from the Gannet Peak S. ½ W., distant three-quarters of a mile; it shows at a third flood, and generally breaks. *South Rock.*

JACCO'S RIDGE.—The shoalest water found on this ridge was 27 feet at low-water springs on its North end, which bears from the Gannet Peak S. by W. ½ W., distant 6 miles; from thence it extends 1½ mile in a Southerly direction, and is narrow, with deep water on its East and West sides, and shows a tide-rip during the tide. Green Island, on the Eastern edge of the Gannet, leads over it. *Jacco's Ridge.*

S.W. SHOAL bears from the Gannet Peak S.S.W. ¾ W., 3¼ miles, and extends a quarter of a mile in a Southerly direction; it has only 19 feet on it, and shows a tide-rip, and breaks in heavy weather. Green Island, just open to the West of the Gannet, leads over this shoal. *S.W. Shoal.*

S.W. DRY LEDGE bears from the Gannet Peak S.W. ⅝ W., 1¾ mile; it uncovers at 2 hours' ebb, and generally breaks at high-water; there is plenty of water between it and the Gannet, but it is prudent to go outside. *S.W. Dry Ledge.*

The bottom at the above shoals and ledges being very uneven, it is highly probable that there may be less water on them than that given by the lead, and therefore vessels are recommended to avoid them.

BETWEEN ELLENWOOD PASSAGE AND BRYERS ISLAND.

MURDER ISLAND WEST SHOAL has 18 feet on it at low-water, which depth lies half a mile from the high-water line of the island, there being a good channel between it and the island. From the North-west point of the island a shoal also extends in that direction, having 12 feet on it at low-water, about a third of a mile from the shore. *Murder Island West Shoal.*

REEF LEDGE, which uncovers at a quarter ebb, is shoal all round for a considerable extent; and there is very little water all the way between it and Reef Island, from the Southern point of which its shoalest part bears W. by N. ½ N., half a mile; and from Jebogue Point S.E. by S., about a mile distant. *Reef Ledge.*

REEF SHOAL has 13 feet on it at low-water, and shows a tide-rip during the tide. Although it can be passed on either side, it had better be kept to the Eastward. Yarmouth light-house open to the Westward of the West tangent of Jebogue Point, clears it to the Westward. From it the South end of Reef Island bears E. by N. ¼ N., 1¼ mile, and Jebogue Point is distant 1½ mile. *Reef Shoal.*

JEBOGUE POINT SHOAL is a large broken patch, with 14 feet water on it, there being a passage with 25 feet in it between the shoal and the point, which is the channel generally used, though the deepest channel lies between it and Jebogue shoal or ledge. *Jebogue Point Shoal.*

JEBOGUE LEDGE OR SHOAL is very dangerous, having only 2 feet on it at low-water springs; it shows a large tide-rip during the tide, and breaks, if there is any sea on, at low-water. It bears from Jebogue Point about S.W. ¾ W., nearly a mile from the high-water line. There is a good channel between this shoal and Green Island. *Jebogue Ledge or Shoal.*

THE FOUL GROUND lies to the North of Jebogue Ledge; it has only 9 feet on it, (which is two-thirds of a mile from the shore,) and shows a considerable tide-rip; there is a good channel between it and Jebogue Ledge. *The Foul Ground.*

THE ROARING BULL lies nearly midway between Green Island and Yarmouth light-house, and very nearly in the line joining them, and a mile distant from the shore. It is about 2 feet above water at low springs, has good water to a cable's length all round, and shows a small tide-rip, but breaks if there is any sea on. *The Roaring Bull.*

TIDES.—From Yarmouth to Ellenwood Island the tide runs inside Green Island and through the above ledges at full 3 knots per hour during its strength; there is a very short interval of slack water. It sets strong round Cape Fourchu, so that, if a vessel is steering for Yarmouth Sound with the flood-tide running, she must be careful to haul up the moment she has cleared the Roaring Bull. It is necessary to impress on the mariner that he should keep clear of these shoals, from the strong probability that the shoalest water has not been obtained by the lead, and that the chances are in favor of there being in reality less water than that marked on the chart. *Tides.*

Anchorages. ANCHORAGES.—The anchorage inside Murder Island and in Little River can only be used by small vessels.

Jebogue is a safe little anchorage, and may be used in cases of necessity by vessels drawing from 12 to 14 feet. The following are the directions for entering it:

A vessel being to the South-west of the entrance between Gannet Rock and Green Island, should bring the Gannet to bear about S.W. by S., and steer N.E. by N., so as to pass midway between Garden Head and the small earthy cliff opposite, (on North-west side,) from which it runs off shoal full a third of the way across, and a bar extends right across, over which there are only 12 feet at low-water springs. Keep mid-channel in the entrance, and anchor 1¼ cable's length inside the point, on the Eastern side of the entrance, round which the channel makes a sudden turn to the Eastward, taking care to keep the Gannet in sight in the middle of the entrance, in order to keep clear of the mud-bank that runs along the Western side, and also of two small mud-banks in the middle of the channel at its head. The depth of water will be about 16 feet at low springs, over muddy bottom, excellent holding-ground, and the water always smooth. Good fresh water can be obtained, the supply being about 3 tons per tide.

If the vessel be to the North-west of Jebogue Point, bring the South end of the earthy cliff to the Northward of Garden Head just open to the Southward of Jebogue Point, and run for it in that direction, which will carry her clear in good water between the Foul Ground and Jebogue Ledge; when about three-quarters of a mile from Jebogue Point she will have passed the Ledge, and may haul more to the Southward, so as to pass round Jebogue Point at a distance of from a quarter to half a mile, when she should steer so as to run along the Northern shore at half a mile distant, until the opening of the harbor bears N.E. by N., and the Gannet Rock S.W. by S., when the course should be altered to the former bearing, to pass half-way between Garden Head and the earthy cliff opposite; when proceed as before.

Yarmouth Sound. YARMOUTH SOUND can be used with all winds, except those between South and West, when it is dangerous if the wind is strong. The best anchorage is in about 20 feet, over sandy bottom, the light-house bearing W. by N. ½ N., about a quarter of a mile. The shore inside the light-house should not be approached within a cable's length, as there are several detached patches of rocks lying off it. At about 2 cables' length from the opposite shore to the light-house, from which they bear about E. by S. ½ S., lie the Hen and Chickens, which begin to uncover at two-thirds ebb. The Independent church at Yarmouth on with the middle of a low beach at the head of the sound, clears them to the Westward. The inner anchorage should not be attempted without a good pilot; but in case of a vessel being caught in the sound in a S.W. gale the following directions will be of use:

The principal dangers are, a rock outside the beacon, lying 1¾ cable's length from the extremity of the Ship's Stern, with only a foot on it at low-water springs; and a rock in the middle of the harbor, inside the beacon, from which it is distant about 3 cables' length, which uncovers 3 feet at low-water springs. Run for the Ship's Stern so as to pass it at a cable's length, leaving it on the port hand, and pass the beacon at the same distance, leaving it on the starboard hand, taking care not to let the light-house, the top of which may be seen over the land, pass beyond the first little island inside the entrance. From thence steer for the Independent church, keeping about 3 cables from the land, and give Battery Point a berth of half a cable's length, and when about 1¼ cable distant from it, you will find safe anchorage. Fresh water can be obtained from wells; that from the lake is not good, and is difficult to get. In Yarmouth Harbor the establishment or times of high-water, at full and change, is 10h. 0m., and the rise varies from 16 feet 9 inches to 12 feet 5 inches. The tide-stream changes its direction a little after high and low water respectively.

Tides.

The Lurcher. THE LURCHER consists of two shoal patches, bearing from each other N.E. ¼ E. and S.W. ¼ W., with 16 or 17 fathoms water between them. That to the South-westward is the larger and shoaler, having only 9 feet on it at low springs, and shows a considerable tide-rip during the run of the tide, near the South-west end of which the shoalest water is, and breaks in heavy weather. The other, bearing from the 9 feet N.E. ¼ E., distant 2½ miles, has 5 fathoms on it, and is very small, but shows a good tide-rip. The South-west shoal bears from Yarmouth light-house N.W. by W. ⅔ W. 14¾ miles.

Tides. TIDES.—At the North-east shoal the ebb commences running 1h. 30m. after high water at Yarmouth; at neap tides it attains a velocity of 2½ knots, the average set being 9¼ miles in a Southerly direction. The flood sets in the opposite direction, its greatest velocity at neaps being 2¼ miles, its average set 8 miles. The slack water is full one hour in duration.

The Trinity Ledge. THE TRINITY LEDGE consists of three small rocks which uncover at low springs, the highest being between 2 and 3 feet above water, and the others just seen. They bear from Cape St. Mary S.W. ¾ W. 6¾ miles; from Black Point W. ¼ S. 6 miles, and

from Fourchu light-house N. by W. 13¾ miles. The highest rock should not be approached nearer than a quarter of a mile. They cause a considerable tide-rip during the tide, at the South-west extremity of which the rocks lie, and in heavy weather they break. There is broken ground all the way from the Trinity Ledge to Black Point, but nothing that will bring a vessel up. The tide-current runs with great strength at the ledge, attaining in the middle of the tide 2 knots per hour; the ebb setting S. ½ W., and the flood N. ½ E.

BRYERS ISLAND S.W. SHOAL bears from Bryers Island light-house S.W. by S. nearly 4 miles, and from the Gull Rock S.W. by W. ¾ W., distant 2 miles. It has only 13 feet water on a small patch where Dartmouth Point is just open to the Westward of the Gull. A long tide-rip extends from the Gull to a mile beyond the South-west Shoal. Between this shoal and the Gull Rock there is a channel 1½ mile broad, and the rock can be approached to a quarter of a mile on its sea side. *Bryers Island S.W. Shoal.*

DIRECTIONS.—In running into the Bay of Fundy, and intending to pass to the N. W. of Grand Manan Island, a vessel being 4 miles to the S.W. of the Blonde Rock, should steer N. by W. ¾ W. 37 miles, which will carry her 4 miles to the S.W. of the shoalest part of the Lurcher; from thence a N. by W. course for 48 miles will bring Machias Seal Islands to bear N.N.E. ¾ E., distant 4 miles; or a vessel having passed Mud Island West Shoal on its Southern side, the light-house being well open to the Westward of Division Point, a N.W. ¾ N. course 7 miles will clear Jacco's Ridge. Passing to the Southward of the ridge, steer N.N.W. ¼ W. 24 miles, when the shoalest part of the Lurcher will bear N.E. by E. ¾ E. 1½ mile; from thence a N. by W. ½ W. course for 48 miles will bring Machias Seal Islands to bear N.E. by E. ¾ E. 1½ mile. *Directions.*

The average set of a tide on the above courses is from 8 to 10 miles per tide, its direction constantly altering, as follows: At the Blonde Rock the ebb sets about S.E. by E. ½ E.; to the Northward of Seal Island, S.S.E. ½ E.; at the Lurcher, South; and at Machias Islands, about S.W. ½ S., beyond which it takes the direction of the shore.

Machias Seal Islands should be passed to the Southward, at a distance of 4 miles; and when they bear N.E. by E. ½ E. 4 miles, the course should be altered to N. by E. ½ E. for 8 miles, when the light will bear S. by E. ¼ E. 6 miles, and a N.E. ¾ E. course 16 miles will bring the vessel due East of Quody light-house, 1½ mile distant. This light should not be approached nearer than half a mile, to avoid the Sail Rocks, which lie about that distance from it.

In the above directions the weather has been supposed clear; should it, however, be foggy, the lead must be frequently used, and the vessel kept on nearly the above courses, according to the following considerations: when nearing the land abreast the Salvages, keep in 30 fathoms, and pass to the Southward of the Brazil Rock by not going under 20 fathoms water over a sandy bottom; after which keep in 20 fathoms, which will carry her outside all the dangers from the Brazil to the Blonde Rock. When near the latter rock, and the vessel making a W. by N. course, the depths will suddenly increase to 30 and 40 fathoms; she will then be past Seal Island, and can haul in N. by W. ¾ W. for the Bay of Fundy. After altering the course, if the depths shoal under 30 fathoms, haul more to the Westward, as the deep water runs close up to the Gannet Rock. A good look-out must be kept for the Lurcher, (which shows a tide-rip,) and the lead kept going when in its neighborhood. The vessel, by continuing the above course, with the lead going and a good look-out, will approach the American shore near Libby Island, when the soundings will shoal, and when in 20 fathoms, the course should be altered to N.E. by E. ½ E.; she will then be running parallel to the coast until she reaches Quody light, when the coast trends more to the Northward.

In running for Yarmouth, or intending to pass to the South-east of the Grand Manan inside the Lurcher, after passing Jacco's Ridge, a N. ¼ E. course for 7 miles will clear the Gannet Dry Ledge, and lead to the Northward of the Gannet; then N. by E. ½ E. 10 miles, will lead outside Green Island, which is bold on its West side, to within 3 miles to the Westward of Yarmouth light-house. If the vessel has passed between Round Island and Bald Tusket, there is a good passage between the Gannet and the Tusket Island. Keep the light-house well open to the Eastward of Green Island, which will clear all the dangers off the Gannet, passing inside of them; pass Green Island, which is bold on the East side, from half to a quarter of a mile, then steer N. ½ E., until the light-house bears to the Eastward of N. by E. ½ E., in order to pass outside the Roaring Bull.

After running through either Schooner or Ellenwood Passage, and being abreast of the low part which connects the two high portions of Murder Island, and from 2 to 4 cables' length from the shore inside Murder Island West Shoal, alter course to N.W. to pass between it and the shoal that extends off the North-west point of Murder Island. When Yarmouth light-house opens of the West tangent of Jebogue Point, a vessel will be clear of and outside Reef Shoal, and wishing to run along the coast inside

the dangers, the course should be altered to N. $\frac{1}{8}$ W., running for the light-house, keeping it a little open to the Westward of the West tangent of Jebogue Point, so that when the point bears E. by S. $\frac{1}{2}$ S. its high-water line will be from a quarter to half a mile distant. Run along shore, preserving this distance to keep inside the foul ground; and when Pinkney Point shuts in of Jebogue Point, the distance may be gradually increased to two-thirds of a mile until the Roaring Bull is passed, which is about a mile from the land. Cape Fourchu is bold, and may be safely approached to 2 cables' length. If wishing to run outside the dangers, preserve the former (N.W.) course until the line joining Green Island and the light-house is passed, when the course may be altered to N. $\frac{1}{2}$ E. until the light-house bears to the Eastward of N. by E. $\frac{1}{2}$ E.

From Cape Fourchu, to run inside the Lurcher and Trinity Ledge, for Grand or Petit Passages: With Yarmouth light-house bearing E. by S. $\frac{1}{2}$ S. 3 miles, a N. $\frac{1}{2}$ E. course for 28$\frac{1}{2}$ miles will carry a vessel to Peter Island, leaving the Trinity about a mile to the Westward, and Cape St. Mary about 3$\frac{1}{2}$ miles to the Eastward. If bound to Petit Passage, a N. by E. $\frac{1}{2}$ E. course will carry her well inside the Trinity, and about three-quarters of a mile to the Westward of Cape St. Mary. In foggy weather it will be better to make the land in the vicinity of Cape Fourchu, when a N. $\frac{3}{4}$ E. course for 16 miles will bring her near Cape St. Mary. When passing Chegoggin Point, care must be taken not to approach the land to the Northward of it nearer than half a mile until abreast of Cranberry Head, after which the projecting points to Cape St. Mary are pretty bold and may be approached, bearing in mind that the lead should be kept constantly going and the depth not decreased under 8 or 10 fathoms; if any doubt arises, anchor. When near Cape St. Mary, great care must be taken to avoid a shoal which dries at low-water, and which runs off a quarter of a mile in a S.W. by S. direction; the flood-tide round this shoal shows a considerable tide-rip to the extent of full half a mile. From Cape St. Mary to Montegan, the coast is bold, and the cliffs in some places rise 100 feet above high-water. From Cape St. Mary to Grand Passage, steer N. by W. $\frac{1}{4}$ W., in order to make the South-eastern part of Bryers Island at from one to two miles to the Southward of the passage, a small allowance being made for tides. Across the entrance of St. Mary Bay the flood-tide has a greater general effect than the ebb, which is chiefly confined to two strips of current from Petit and Grand Passages respectively in the direction of Cape St. Mary. At Montegan, the current sets along the coast, the flood at its greatest velocity attaining one knot, and the ebb about two-thirds of a knot per hour.

GRAND PASSAGE AND WESTPORT.

The principal dangers in Grand Passage are:

Passage Shoal. PASSAGE SHOAL, which has 5 feet on it at low-water springs, lies in the middle of the passage, bearing from Peter Island light-house N. $\frac{1}{2}$ E., 4 cables' length distant and shows a tide-rip during the tide.

Cow Ledge. COW LEDGE.—The highest part shows soon after high-water, and is distant 1$\frac{1}{2}$ cable's length from Long Island, to which it is joined at low-water. Peter Island light-house bearing S. by W. $\frac{1}{2}$ W., with the island its own breadth open to the Westward of Sand Point, clears the ledge to the Westward.

Cow Ledge Shoal. COW LEDGE SHOAL has 14 feet on it at low-water, and lies a quarter of a mile to the Northward of the highest part of Cow Ledge, and S.E. $\frac{1}{4}$ E. 3 cables' length from the North point of Bryers Island. Peter Island bearing S. by W. $\frac{1}{2}$ W., with the isl. and open its own breadth to the Westward of Sand Point, clears it to the Westward.

Directions. DIRECTIONS.—Grand Passage has two entrances to the Southward, one on each side of Peter Island; that on the West side is the shorter and narrower, and has 24 feet in it, and no dangers. In entering the latter passage keep in mid-channel, and if the flood is running great care must be taken, as the tide sets directly on the South point of Peter Island with great strength. When through the channel, and wishing to anchor at Westport, haul to the Westward, giving the point on Bryers Island a berth of nearly a cable's length. Anchor with the Episcopal church bearing S.W. $\frac{3}{4}$ W., and the Baptist chapel W. $\frac{1}{8}$ N., in from 5 to 7 fathoms at low-water, over hard bottom, but the water will be smooth. A small supply of fresh water may be obtained from wells.

Tides. TIDES.—The establishment at Westport is 10h. 39m.; the greatest rise observed at high-water was 21 feet 6 inches, and the least 16 feet 3 inches; the highest low-water 7 feet, and the lowest 11 inches. The tide commences running to the Southward full half an hour before high-water. The tide-stream runs with great velocity through Grand Passage, especially through the two channels at its Southern entrance, where it attains the rate of from 5 to 6 knots per hour.

If wishing to run through the Western entrance without anchoring at Westport, instead of hauling to the Westward preserve a Northerly course, taking care not to approach Bryers Island nearer than 1$\frac{1}{2}$ cable, to avoid a rocky shoal which runs off that

island a little beyond the North end of Westport, about that distance off; and on the other hand, keep Peter Island light-house to the Southward of S. ½ W., until half a mile to the Northward of the island, in order to clear Passage Shoal, when the light must be kept to the Southward of S. by W. ½ W. until the North end of Bryers Island bears N.W. ¾ W., when a vessel will be clear of Cow Ledge and Shoal, and by keeping the light-house in sight, will pass a long way to the North-eastward of the N.W. Ledge, and may approach Long Island, which is bold, to a cable's length. Care must, however, be taken, not to run very close to the Northern point of Bryers Island, for it is shoal for a cable's length in a North-easterly direction, and also 1½ cable in a Northerly direction from the high-water line of the point.

To run through the Eastern Entrance, keep the South point of Peter Island a little on the port bow to avoid Dartmouth Point, which should be given a wide berth; on the flood, pass along the Eastern side of Peter Island, which may be safely approached to half a cable's length. Preserve a Northerly course, taking care not to bring the light-house to bear to the Southward of S. by W. ½ W., until half a mile beyond it; nor to approach the Long Island shore, until arriving at Sand Point, nearer than two cables' length; after passing Sand Point, care must be taken not to bring the light-house on Peter Island to the Westward of S. by W. ½ W., and then steer as before recommended.

When Peter Island is passed, and wishing to anchor at Westport on the flood, haul sharp round the North end of the island, taking care to keep a full cable's length off the high-water line, or two cables' length from the light-house, in order to avoid the shoal point off the Northern end of the island, and pass between it and Passage Shoal, on which the flood sets directly and with great strength.

A buoy on Passage Shoal would greatly facilitate the navigation of this passage, and the entrance to Westport, which affords a very safe anchorage with all winds, except from N. ½ E. to N.N.E. ½ E., to which it is exposed; but the water is always smooth in the position recommended for anchorage.

FROM CAPE SAINT MARY TO RUN THROUGH PETIT PASSAGE.

DIRECTIONS.—Cape St. Mary bearing East one mile, a N. by E. ½ E. course, distance 16¼ miles, will carry a vessel to the South entrance of Petit Passage, the South point of Digby Neck bearing E.N.E., half a mile; this point must not be approached close to, for some rocks run off it nearly a cable's length in a Southerly direction. *Directions.*

In running through the passage, keep about mid-channel. The Western shore is bold, and may be approached, especially at Eddy Point, which projects into the passage; the Eastern shore to the Northward of Sand Point has a ragged rocky bottom to about 1½ cable from the high-water line. Care must be taken in approaching the Boar's Head, (the point at the North-west entrance of the passage,) off which lies a rock with only 8 feet on it at low springs; it bears from the point about N. by E. ½ E., 1¾ cable's length distant, and shows a tide-rip during the strength of the tide-stream, and breaks in heavy weather. There is a passage with 25 feet at low-water between this rock and the shore.

When running for Petit Passage on the ebb, and off Cape St. Mary, steer for the middle of Long Island about N. ½ E., until the strip of tide is passed which runs from the Passage to the Cape, beyond which, on the Long Island shore, a feeble eddy is formed, running towards Petit Passage, which increases in strength and diminishes in breadth on approaching that passage, where it reaches up to Eddy Point, which can be rounded close to.

When through the passage, or on the Bay of Fundy side, Boar's Head bearing S.W. eight-tenths of a mile, Partridge Island light (St. John, New Brunswick) will bear N.N.E. ½ E., 49½ miles distant.

When in the Bay of Fundy, and wishing to enter Petit Passage on the ebb, make the Digby Neck shore to the Eastward of the passage, and skirt it along until in the passage, in order to prevent the tide sweeping the vessel by the entrance. The above shore can be approached with safety to about 1½ cable, where there is a depth of about 5 fathoms at low-water.

Petit Passage is the shortest route between St. John and Cape Fourchu, and is to be preferred by steamers and smart sailing vessels with a leading wind through the passage, not only on account of the lesser distance, but because it is entirely free from dangers. A small light on Eddy Point would be of great advantage.

TIDES.—The tide runs through Petit Passage at a rate of from 6 to 7 knots an hour. High-water happens about two minutes before, and the range exceeds that in Grand Passage by one-twentieth. An eddy is formed on the Western shore of the *Tides.*

passage to the Northward of Eddy Point, where small vessels can anchor close to the shore, but require to be moored head and stern on the ebb-tide.

St. Mary Bay. ST. MARY BAY.—When off Cape St. Mary, and bound up St. Mary Bay, the coast is bold, and may be approached until you arrive at Montegan, where it becomes low, and beyond which rocky ridges run off the shore in a direction at right angles to its trend as far as Groscocq; the shore should be given a berth of a mile. Beyond Groscocq the coast becomes bolder, until within a short distance of the entrance of the Sisibou River, where a shoal runs off; by keeping rather more than half a mile from the shore, a vessel will pass outside in about 5 fathoms at low-water springs; after which, when the remarkable notch in Sandy Cove shows open, she can haul in towards the entrance of the river, and find good anchorage in about 5½ fathoms at low-water, over mud bottom, at rather less than half a mile from the shore.

Long Island. LONG ISLAND.—The St. Mary shore of Long Island is very bold, and a vessel can run close along it, except in rounding Dartmouth Point, off which some ragged rocks lie nearly one and a half cable distant.

The Bay of Fundy shore of Long Island is bold, and after passing Cow-ledge Shoal can be approached to one cable's length, until you reach Boar's Head, where only small vessels or steamers should attempt to pass inside the rock before described.

Bryers Island N.W. Ledge. BRYERS ISLAND NORTH-WEST LEDGE.—This ledge, which is of large extent, and lies to the North-west of Bryers Island, has very deep water to the North-west close to it, and a good passage between it and the island; the North-western shore of the island may be safely approached to 2 cables' length.

On this ledge there are several shoal spots, the principal of which are the N.W. Rock, Batson's Rocks, and the Frenchman's Elbow.

North-west Rock. NORTH-WEST ROCK has only 6 feet on it at low springs, and is of small extent. The 6-feet bears from Bryers Island light-house N. by E., 4⅛ miles, and from station on Bryers Island, N. by W. ½ W., 3¾ miles; a large granite boulder on a hill on Long Island, on with the North point of Bryers Island, (over which it is seen,) leads clear of this rock and of the whole ledge, passing in good water to the Northward of it.

The Batson. THE BATSON consists of two rocks, or small shoals, the least water on which is respectively 12 and 13 feet at low springs; they lie S.W. ½ W. and N.E. ½ E. from each other, and nearly a cable's length apart, with 5½ fathoms between them. The 12-feet spot bears from the North-west rock, W. S.W. ½ W., distant one mile; from Bryers Island light-house nearly North, 3 8/10 miles; and from Bryers Island station N. N.W. ¾ W., 3 9/10 miles.

The Frenchman's Elbow. THE FRENCHMAN'S ELBOW is a long shoal strip, with 5½ fathoms water on it, and lies between the North-west Rock and Bryers Island, in the direction of the North point of the latter, and distant about one mile from the former.

To the South-west of the Batson, the ridge extends to a considerable distance in that direction, gradually increasing in depth, with deep water on both sides of it.

The North-west Ledge shows a large heavy tide-rip during the strength of the tide and breaks heavy on its shoal parts when there is much sea.

The Gull Rock, well open of the point of Bryers Island to the South-east of the light-house, clears the Batson Rocks, passing to the Southward of them; and the Gull on with the point will lead over the North-west Ledge, between the Batson and North-west Rock.

Tides. TIDES.—The tide-stream runs very strong over the North-west Ledge, the ebb taking a Southerly and the flood a Northerly direction, at the rate of about 4 miles an hour at half-tide, when it attains its greatest velocity. The stream changes its direction here about three-quarters of an hour after that in Grand Passage, or nearly about the time of high and low water there.

Directions. DIRECTIONS.—In sailing from Cape Fourchu to St. John, and intending to run between the Grand Manan and Bryers Island, with Cape Fourchu light-house bearing E. by S. ½ S., 3 miles, a N. by W. ¼ W. course, 27 miles, will lead 3 miles to the Westward of Trinity Ledge, and about the same distance to the Westward of Bryers Island South-west Ledge; from thence steer N. ¼ W. 8 miles, when the Batson Rocks on the North-west Ledge will bear about E. by S. ½ S., rather more than 5 miles; the course to St. John is then clear of all danger, and Partridge Island will bear N.E. ½ N., 60 miles.

Caution. CAUTION.—In foggy weather it requires a very careful look-out, and the lead frequently hove, to make this passage; in which case, when abreast of the Trinity Ledge at the distance above mentioned, if a depth of less than 30 fathoms is obtained, haul more to the Westward. When approaching the South-west Ledge, you should be in about 40 fathoms. The tail of this ledge runs out a considerable distance to the South-west, and shows a ripple during the tide; if, therefore, you go from deep to shoal, and then deepen again and see the ripple, you will know you have

crossed the tail of the shoal, and by referring to the chart and depth of water, will pick up your place pretty exactly. In approaching the North-west Ledge, keep beyond 40 fathoms; and in a similar manner to the above, you may pick up your position, when crossing the tail that runs out a considerable distance in a South-west direction from the Batson.

TIDES.—The tide-stream from Cape Fourchu to Bryers Island will set a little across the above courses from 5° to 10°, and run about 2 knots an hour during 4 hours on each tide, the ebb setting the vessel to the Westward, and the flood to the Eastward of her apparent course. After passing Bryers Island, the direction of the stream suffers a considerable alteration, setting N.E. and S.W. *Tides.*

ANNAPOLIS GUT.—Pursuing the coast along shore from Bryers 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 port shore, until they are past the island, which is shoal all round, and from thence they can steer up mid-channel towards the town. *Annapolis Gut.* *Light-house.*

In addition to the above, Mr. Lockwood observes, "That the abrupt precipices of the highlands which form the gut, cause those gusts of winds 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 inshore, near the outer Western point; in some places the depth is from 40 to 80 fathoms."

BLACK ROCK POINT.—On this point there is a light-house, 45 feet above sea-level at high-water, (rise and fall about 50 feet,) three-quarters of a mile East of it, and at Givan's Breakwater, 2½ miles Westerly. It will be a guide-light for vessels in clear weather, making Spencer's Island anchorage and the channel leading into the Basin of Mines. The following are bearings of the prominent headlands within view from the light: *Black Rock Point.* *Light-house.*

Bearings.

Long Point, South shore	S.	86½	degrees	West.
To Givan's Breakwater	S.	81	"	"
Isle of Haute	N.	49	"	"
Cape Chignecto	N.	21	"	"
Cape D'Or	N.	13½	"	East.
Spencer's Island	N.	35	"	"
Cape Split	N.	66½	"	"
Range of shore towards Hall's Harbor	N.	89	"	"

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 highlands, which appear very even. In the channel or narrows leading into the Basin of Mines, from Cape Split to Cape Blow-me-down, 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 Blow-me-down 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 knots. Having passed Cape Blow-me-down, 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 *Annapolis to the Basin of Mines.*

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 Sharpe and Partridge Island, and you should be desirous of proceeding to Windsor River, it will be necessary to get under way 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 Blow-me-down 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.

Light. HORTON BLUFF LIGHT.—A beacon light on Horton Bluff, in the Basin of Mines, 95 feet above sea-level, high-water—rise and fall, 40 to 45 feet.

The building is square, painted white; stands 60 feet from the bluff, and shows a white light, which may be seen in clear weather over the greatest part of the Basin of Mines, (after passing Cape Blow-me-down,) and above the Five Islands, and up Windsor River, until intercepted by the continuation of the bluff to the Southward of it.

Course to Boot Island, entrance of Cornwallis River	N. 14°	W.
" Cape Blow-me-down	N. 2	W.
" Partridge Island, (Parrsborough)	N. 2	E.
" Largest group of Five Islands	N. 38	E.
" West side of river, or continuation of bluff	S. 35	E.

Haute Island. 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 highlands, 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 a great rapidity, and are known to rise, at the equinoxes from 60 to 70 feet perpendicular.

Chignecto Bay. 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 port or Northern shore running out to seaward; this is called Cape Enragée, 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.

Light-house.

Cape Capstan. CAPE CAPSTAN.—On this cape there is a light-house which shows two lights horizontally, when approaching it from the Westward or seaward side. The lights are about 40 feet above high-water (rise and fall about 55 feet). The building is square and painted white, and is a conspicuous beacon in the day-time to mark the entrance

Light-house.

of Apple River, a place of resort for vessels of 100 tons and under. The following bearings are given from the light:

To the Sister's outermost head	S.	61	degrees	West.
Salmon River	N.	9	"	"
Cape Enragée Light	N.	41	"	East.
Grindstone Light	N.	51	"	"
Along shore, Easterly	N.	62	"	"

Bearings.

CHIGNECTO BAY TO THE MANAN ISLANDS AND PASSAMAQUODDY BAY.

THE NORTH COAST OF THE BAY OF FUNDY, from Cape Enragée 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: 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 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. *North Coast of the Bay of Fundy.*

QUACO LIGHT, white and red, horizontal, is on a small rock off Quaco Head, W. ¼ S. from St. Martin's Head; it is a revolving light; time of revolution 30 seconds. *Quaco Light.*

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 2 cables' length all the way round, but they shoal more gradually from the N.E. *Quaco Ledge.*

At low-water, spring tides, the highest rock is 12 or 14 feet above water, and as much under at high-water. In light winds and smooth water it is not visible, and therefore dangerous.

The night tides here, and generally throughout the bay, are highest; at St. John 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 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 have nowhere 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. High-water 11h. 44m., rise 21 to 25 feet. *St. John Harbor.* *High-water.*

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 2 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 depth 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 *City of St. John.* *Light-house.* *Beacon.*

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 inshore 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 edge of St. John 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 block-house, 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.

Tide. 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.

From St. John out of the Bay of Fundy. FROM ST. JOHN OUT OF THE BAY OF FUNDY.—To run mid-channel between the Gannet Rock and Batson North-west Ledge; after leaving Partridge Island, steer S.W. ¼ S., about 55 miles, which will lead about half-way between the rock and the ledge, when you will have soundings in about 100 fathoms, or rather more. The deep water runs close up to the Old Proprietor off Grand Manan, on the one hand, and the North-west Ledge on the other, so that when sailing in this direction, and in 60 or 70 fathoms, a sharp look-out is requisite.

From the above position, half-way between the Gannet and the Batson, the shoalest part of the Lurcher will bear about S. ¾ W., distant 35 miles; there will be plenty of room to pass either side of it.

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. 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 1½ 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. Light. 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, 81 feet high, red and white, horizontal, with two fixed lights, one elevated 28 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 anything 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 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. 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 navig-

tion 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 and 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.

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, when 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.

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 anywhere on the coast; water can be procured in various places. The bay is extensive, secure, and well sheltered, having good anchorage throughout. High-water 11h. 10m., rise 21 to 25 feet.

High-water.

St. Andrew's Harbor.

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 2 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.

Dangers.

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.

Reef.

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. 50m. Common tides rise 20 feet; spring tides 26 feet.

High-water Tides.

Light.

LIGHT.—On the North point of the entrance there is a light 35 feet high; it contains a fixed light.

Wolf Islands.

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 anywhere between the Wolves and Beaver Harbor, in good holding-ground, with a depth of 20 or 25 fathoms.

The Manan Islands.

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 part of Charlotte County; being 14½ miles in length and 7 in breadth. According to the chart, the North-western part of this island is distant from Passamaquoddy Head about 7 miles; its North-eastern point, or Bishop's Head, bears from Cape Maspect W. by 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 Bryers 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. 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 gale 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 Grand 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 North-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. 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. 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 Bryer 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 lies South of the South-west point of White Head Island; some of these have deep water between them, and occasion a continual ripple 3 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 South-west 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. Light.

THE GANNET ROCK, on which there is a light-house, painted black and white, vertical, containing a flashing light, which flashes three times each minute, 66 feet above water, and lies S.W. by S., distant 3½ miles from the Southern point of the Three Islands, and S.S.E. 6¼ miles from the South-west 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. Light-houses.

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 165 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:

Bearings.

To the Southernmost of the Murr Ledges, E.S.E.
To Gannet Rock light-house, E. by S. ¼ S., about 12 miles.
To N.E. Rock, N.E. by N., about 1½ mile.
To the Southern head of Grand Manan, E. by N. ½ N.
To West Quoddy 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.

Rocks.

ROCKS.—There is a rock of 11 feet at low-water, which bears from the light on Seal Island N. 15° E., distant 2½ miles; and a rock 6 feet above water, which bears N.E. by E. ½ E., three miles from the light.

Pilots.

PILOTS.—The pilots for St. John, St. Stephen's, and St. Andrew's, are to be found off Little River, or the Seal Islands.

THE COAST OF THE UNITED STATES.

FROM PASSAMAQUODDY TO CAPE COD.

SHIP-MASTERS will please remember, by following the directions given below, published under the authority of the Light-house Board, that it will render their entering into and departure from a port much easier.

Directions.

DIRECTIONS.—In conformity to the terms of the act of Congress, approved September 28th, 1850, prescribing the manner of coloring and numbering the Buoys along the Coasts and in the Bays, Sounds, Rivers, and Harbors of the United States, the following order must be observed, viz.:

1. In approaching the channel, &c., from seaward, RED BUOYS with even numbers will be found on the STARBOARD side of the channel, and must be left on the STARBOARD hand in passing in.

2. In approaching the channel, &c., from seaward, BLACK BUOYS with odd numbers will be found on the PORT side of the channel, and must be left on the PORT hand in passing in.

3. BUOYS painted with RED and BLACK STRIPES will be found on obstructions, with channel-ways on either side of them, and may be left on either hand in passing in.

4. BUOYS painted with WHITE and BLACK PERPENDICULAR STRIPES will be found in MID-CHANNEL, and must be passed close to avoid danger.

5. All other distinguishing marks to buoys will be in addition to the foregoing, and may be employed to mark particular spots, a particular description of which will be given in the printed lists of buoys.

6. Perches with balls, cages, &c., will, when placed, be at turning points, the color and number indicating on what side they shall be passed.

7. No deviations from the foregoing directions will be permitted.

Tides. TIDES ON THE UNITED STATES SEA-COAST.—The article on the tides will be found in the first part of the Coast Pilot, immediately after that on the Gulf Stream.

Banks. 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. CASHE'S LEDGE.—The position of this shoal has been accurately determined by Lieut. Charles H. Davis, U. S. Coast Survey. It is in latitude 42° 56′, longitude 68° 51′ 30″, and has on it 26 feet.

East by the compass, 17 to 18 leagues from Thatcher's Island, you get soundings upon the Fippanies, a bank of 8 or 10 leagues in extent from North to South, about 6 miles wide in the centre and the Northern end; on the Southern end it is 2 to 2½ miles wide. The depth varies from 27 to 46 fathoms, shelly and pebbles.

From the Eastern edge of the Fippanies, East 4 to 5 leagues, will bring you upon Cashe's, on the shoal ground, which is on the Eastern edge of the bank, and is a flat white rock of from 200 to 300 feet in extent.

South of the flat rock there is a gully, 90 fathoms water, which runs in upon the bank in a South-westerly direction. Upon the South side of this gully, 3 miles South of the flat rock, there is a shoal of 7 fathoms, from which the soundings run suddenly to 15 and 30 fathoms on all sides except the East, where it deepens sundenly to 80 fathoms.

N. by W., 9 miles from the flat rock, there is another shoal of 14 fathoms; between this and the flat rock there are from 10 to 35 fathoms, rocky bottom; on the rocky bottom there is kelp of 45 feet in length; on the flat rock there is none.

GEORGE'S SHOAL.

A Report relative to the Survey of George's Shoal, 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 latitude 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 3 feet to 9 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 12 to 16 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 in 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 situation 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 3 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 4 miles. The shoalest part, having 6 fathoms, is very narrow, and composed of hard sand. But there are not more than 12 fathoms of water for 3 miles South of the above latitude. On the North side, at 2 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 8 fathoms water, having, however, considerable breakers. There are but 17 fathoms for 3 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 2 miles long from East to West, and has several fathoms water. To the South, there are but 17 fathoms for 2 miles. In other directions there are from 20 to 30 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, at 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 situation, 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-place 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 latitude 41° 51′ N., and longitude 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. 2 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 of 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 which 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 hens' 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 Lieut. 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″."

High-water.

Clark's and Little George's Banks.

CLARK'S AND LITTLE GEORGE'S BANKS of the charts are proved, by later examinations, not to be accurately defined, and are but parts of the shoal ground of George's Bank. They are erased from E. & G. W. Blunt's charts, and the name of Stellwagen's Shoal Ground substituted, after the commander of that name, on the U.S. Coast Survey.

Stellwagen's Shoal Ground.

STELLWAGEN'S SHOAL GROUND.—Commander H. S. Stellwagen, U. S. N., by his soundings has shown the existence of this bank of over 2,000 square miles, extending from George's Shoal to the Westward 25 miles, to South-west 50 miles, to the

Southward 30 miles, its Eastern limits not yet defined; having on it as little as 9 fathoms water, in some cases rocky bottom.

THE FISHING GROUNDS of George's Bank are between latitudes 42° 05′ and 41° 18′, longitudes 66° and 67° 45′, in depths of water varying from 15 to 80 fathoms, generally 20 to 35 fathoms. *The Fishing Grounds.*

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. *The Bay of Passamaquoddy.*

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 three-quarters 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 or 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— *Western Passage.*

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 port 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. *Bearings.*

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. *Tide.*

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 133 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 9 miles. *Light-house.*

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. *Alarm Bell.*

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 three-eighths of a mile distant, lies a rock, called Black Rock, which is not covered at high-water, and is bold around.

The Middle Ground is a shoal, near the middle of West Quoddy Bay, about one-quarter 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 5 feet at low water, and which bears from West Quoddy Head N.N.W., distant about one mile. *Buoy.*

From the above-mentioned buoy, N.W. by N. ¼ N., about 1½ mile distant, is a nun buoy, painted red, and moored in 2 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 boy, 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.¼W., distant about three-eighths 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 port hand, in running through the narrows.

Pilot. 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. *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, 40 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.

High-water. 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, near 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, from 12 to 70 and 75 fathoms; the greatest depths 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 Camp Bello, is a remarkable large rock, called the White Horse Rock.

Campo Bello Light-house. 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. 60° 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. 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. 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 12 miles.

If bound for Moose Island up the River Scodic, 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 port hand, 6 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, 2 miles above which, off a small island, from which it bears N.E., is a shoal on your port 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 port hand, one-fourth of a mile distant; and your course from this to the Devil's Head, (before mentioned,) which you leave on your port hand, is N.N.W. 3 miles. When you have passed the Devil's Head, your course is W.N.W. one league, when you will come to a large ledge of rocks that you must leave on your port hand, which is bare at 2 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 3 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. Andrew's, 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

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 port 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. On the island, at the entrance, there is a fixed light, 40 feet high.

Light.

Machias. Light.

MACHIAS.—Machias light is a fixed light, 52 feet high, on Libby Island, at the Western side of the entrance. 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 port hand; keep on this North course until you pass a round high island on your port 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 port 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.

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-Bec Head Light.

MOOSE-A-BEC HEAD LIGHT is on Mistake Island; it is 65 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-Bec Reach.

MOOSE-A-BEC REACH.—When you come from the Westward, and pass Ladle Island on your port hand, steer N.E. by E. for Tibbet's Island, which you leave on your port 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 lies a cable's length to the S.E. of said island. When you pass it and bring Moose-a-Bec 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 2 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-Bec Bar, which you must not cross before 2 hours' flood, you steer for Kelly's Coffee-house, which lies on the port hand, as you go to the Eastward, on the N.E. point of Moose-a-Bec Reach. When you are entering on the bar, you will bring a bushy tree right against Kelly'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 port 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 2 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-Bec 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 port, and steer E.S.E. for Libby's Island light.]

Moose-a-Bec Head to Machias.

MOOSE-A-BEC HEAD TO MACHIAS.—Give the light a berth of one mile, leaving it on the port 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 port 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 direction for Machias.

Cape Split Harbor. CAPE SPLIT HARBOR.—When you pass Petit Manan 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.

Nash's Island. Light. NASH'S 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.

Coming from the Westward, you must leave Petit Manan light on your port hand, giving it a berth of half a mile; then steer N.E. 10 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. 2½ miles, which will take you into Tibbet's Narrows. These narrows are formed by Tibbet'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 mentioned, 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 Tibbet's Narrows. In coming from the light to the narrows, leave on your port 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 the left is Tibbet's Island, the entrance of the narrows, as before described. It may be proper to observe that Tibbet'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 draught of water, may enter Moose-a-Bec Reach by following the above directions.

Narraguagus light-house. NARRAGUAGUS LIGHT-HOUSE is on the S.E. point of Pond Island; it is 45 feet above sea-level, and painted red. The light is fixed. It bears from Petit Manan light-house N.E. by N., distant 7 miles; from Nash's Island light-house W. ¼ N., distant 6 miles. From Narraguagus light, Strout's Folly Rock bears S.E. by E. ½ E., distant 6¾ miles; East point of Black Ledge bears S.S.E. ¼ E., distant 1¼ mile; S.W. point of Jordan's Delight bears S., distant ¾ mile; S.W. point of Trafton's Island bears N. ¾ E., distant 1½ mile.

Jordan's Delight. JORDAN'S DELIGHT.—On Jordan's Delight ledge is a red buoy, No. 2; from it Nash's Island light bears E. by N. ½ N., 5 miles, and Petit Manan light S.W. ¾ S., 6 miles distant.

Pond Island. POND ISLAND.—There is a black spar buoy, No. 1, on the North point of Pond Island 150 fathoms from shore, Stanwood's house bearing S.W. ½ S.

Trafton's Island Ledge. TRAFTON'S ISLAND LEDGE.—Thirty fathoms West of the middle ledge is a red spar buoy, No. 4, the East end of the island bearing S. by E. ¾ E., three-quarters of a mile distant, and West end of same, bearing S.S.W. ½ W., one mile distant.

Lower Middle Ground. LOWER MIDDLE GROUND.—There is a black spar buoy, No. 3, off the middle of this bank, in 12 feet low-water.

Upper Middle Ground. UPPER MIDDLE GROUND.—On the lower end of this bank is a red spar buoy, No. 6, in 5 feet low-water.

Ledge off Long Point. LEDGE OFF LONG POINT.—Off this ledge, and close to, is a black buoy, No. 5, in 5 feet low-water.

Half-Tide Ledge. HALF-TIDE LEDGE.—Thirty fathoms South of the dry part of this ledge is a red buoy, No. 8, in 3 feet low-water.

Petit Manan light. PETIT MANAN LIGHT is a flashing light, 125 feet above the level of the sea, on the South end of Petit Manan Island, and there are several dangerous ledges bearing from the light. The tower is of granite, and of that color.

Jackson's Ledge, or Eastern Rock, on which there are 12 feet at low water, bears East, 4 miles.

South-east Rock, on which there are 7 feet, bears S.E. by S., 4 miles.

A ledge with 16 feet S.S.E., 2 miles.

Moulton's Ledge, W. by N., 4 miles, nearly bare.

There are also several shoal spots bearing from the light, from S. to S.S.W., about 3 miles distant.

PLEASANT RIVER.—When you come from the Westward, and bound for Pleasant River, in passing Petit Manan 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 Captain 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 Captain 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. *Pleasant River.*

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 port hand best on board.

BOWBEAR HARBOR.—In coming from the Westward, bound to Pigeon Hill, or Bowbear Harbor, bring Petit Manan 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. *Bowbear Harbor.*

DYER'S BAY.—In coming from the Eastward, bound to Dyer's Bay, give Petit Manan 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 port 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. *Dyer's Bay.*

GOLDSBOROUGH HARBOR lies N.N.W. from Petit Manan light-house, 2 leagues distant, leaving one island, covered with trees, on your starboard hand, and two on your port 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. *Goldsborough Harbor.*

PROSPECT HARBOR has a revolving light on the East point of entrance. From Petit Manan it bears N.W. ½ W., distant 6 miles, but is not visible from that point; from Shepdick Island it bears N.N.E., distant 4 miles—and in sailing along the coast is visible only between the bearing N. by E. ½ E., and N.W. by N. *Prospect Harbor. Light.*

Clark's Ledge (the old point of entrance to the harbor) lies S.W. by S., distant one-third of a mile from the light; Big Ledge S. by E., distant 2½ miles; Little Black Ledge S. by E. three-fourths of a mile. Little Black Ledge is nearly covered at high tide, and bears S. ½ E., one mile from Crenburg Point, and E. ½ S. from Big Ledge, which is high above water. There is a good passage between the two ledges.

Bring the light to bear N.W. by N. ½ N., and steer for it, leaving Little Black Ledge on the port, and Cranberry Point on the starboard hand; when up with the light give it a berth of 200 fathoms, leaving it on the starboard, and Clark's Ledge on the port hand, sailing W.N.W. for the middle of the harbor. Anchor with the light bearing E. ½ N.

WINTER HARBOR.—There is a fixed white light on Mark Island. The tower is painted brown. *Winter Harbor. Light.*

MOUNT DESERT TO GOLDSBOROUGH AND MACHIAS.

In going from Mount Desert to Goldsborough, you must steer E. ½ N. for Scuttock Point, 4 leagues, where there is an island which you may pass either side of, but it is best to leave it on your port 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 port hand, and go in the Eastern Passage. In standing in for this place, you will see Petit Manan light-house, which you leave on your starboard hand. North from Petit Manan, 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 Petit Manan Island, keep E.S.E., one-half mile distant, which will clear a ledge having 9 feet water at low-water, that lies E. of the *Light.*

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 Desert Rock. Light-house. MOUNT DESERT ROCK.—This rock is 15 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. There is a fog-bell on this rock, near the light-house. It is about 50 feet above the level of the sea, and strikes about 7 times in one minute. S.W. by S., 3614 feet from the rock, there is a ledge of 3 fathoms; inside there are 22 fathoms; outside, close to the rock, there are 17, 18, 20, 25, 30, and 35 fathoms water; it has been called Columbia Ledge by Capt. Owen, R. N., who surveyed it.

Mount Desert Island. MOUNT DESERT ISLAND forms the Northern side of the passage to Bear Island, and may be known by several high hills upon it. This island is about 15 miles long, from North to South, and 12 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.

Light. Bear Island lies near the centre of the passage between Sutton's Island and Mount Desert: it is a small island, covered with spruce trees. The light stands upon its Western end, elevated 65 feet above the level of the sea, exhibiting a fixed light, and may be seen in clear weather a distance of 12 or 15 miles.

Mount Desert, Eastern Pass. MOUNT DESERT, EASTERN PASS.—In coming from the Westward, and intend going into Mount Desert, bring Baker's Island light to bear North, and run for it, leaving it on your port hand. After passing it steer N.N.W. until the light on Bear Island bears W.N.W., and run direct for it. In running this course, you will leave Sutton's Island on your port hand. The shores around this island are very bold, and you may near it within one cable's length.

Pumpkin Island light. PUMPKIN ISLAND LIGHT.—A light-house has been erected on Pumpkin Island, as a guide to the Western entrance of Edgemoggin Reach, and to Buck's Harbor. The tower is of brick, and painted white. The keeper's dwelling is painted brown. The tower is 17 feet high, and the light is 27 feet above the level of the sea. It is of the 5th order.

Edgemoggin Reach. Triangle Ledges. EDGEMOGGIN REACH.—WEST TRIANGLE LEDGE bears N.E. by E. ½ E., distant one-third of a mile.

EAST TRIANGLE LEDGE bears E.N.E., distant one-half of a mile.

These ledges have about 4 feet water on them at low-water, and there is a good passage between them and the light.

The ledge making out to the Northward and Eastward from Pumpkin Island is covered at high tides, but the water is bold close to the outer point.

The water is bold close up to the North point of Pumpkin Island, and the point can be passed safely within the distance of the length of the vessel.

At about a cable's length from the shore, on the West and North-west part of the island, there is shoal ground with 4 feet at low-water.

There is a good passage of 6 feet at low-water between Pumpkin Island and Deer Island. When bound to the Eastward, the port shore must be kept close on board.

Merriman's Ledge. MERRIMAN'S LEDGE bears West, distant five-eighths of a mile; bare at extreme low tides. The leading-mark for this ledge is Billing's house (on the North side of the Reach) in range with the light-house. By keeping the house out either way of the high part of the island will lead clear of the ledge. The cross-mark is to bring the points of Deer Island and Birch Island open an oar's length. The ledge is about 20 fathoms in width, and the water bold.

Two-Bush Ledge. TWO-BUSH LEDGE bears W. by S. ¼ S., distant about 1¾ mile. It has 4 feet water on it at low-tide; it is about the dimensions of the deck of a vessel of 150 tons, and the water bold. This ledge bears N. by W. ¼ W. from Eagle Island light-house. The leading-mark for Two-Bush Ledge is the barn on Beach Island open a handspike's length from the South point of Hog Island. The cross-mark is Two-Bush Island, in the gap North of Eagle Island light. Two-Bush Island is small, without bushes or trees, produces grass, and appears green in summer. It had formerly two bushes upon it, from which it derived its name. The water is bold close to it. It bears S. W. from the Pumpkin Island light, and N. by W. ¼ W. from Eagle Island light.

Spectacle Island Shoal SPECTACLE ISLAND SHOAL.—This shoal lies on the North side of the channel leading to Buck's Harbor: bears from Pumpkin Island light W. by N., distant 2½ miles; from the South point of Spectacle Island E. ½ S., distant half a mile; from Long Ledge S.W. ½ W., distant one mile, and has 4 feet water on it at low-tide. It is about half an acre in extent, with a number of large rocks on it.

In passing Cape Rosiere, bound to the Eastward, to clear it to the Southward, keep the passage between Pumpkin Island and Deer Isles open a handspike's length, and when Two-Bush Island and the West end of Pickering's Island are in range, you are up with the ledge.

In running for Buck's Harbor, to clear the ledge, keep Walker's house (a conspicuous white house on the Eastern part of Buck's Harbor) open an oar's length from Long Ledge.

Long Ledge.

Long Ledge lies on the North side of the channel, and is nearly covered at high-water, but is exposed at low-water; may be known by a single rock which lies a cable's length S.E. from it, and which is visible at half-tide. This ledge bears N.W. ¼ W., distant about one mile from Pumpkin Island light, and from the West entrance to Buck's Harbor, S.W. ½ W.

Fiddle Head.

Fiddle Head (N.E. point of Hog Island) bears from the light W.S.W.; South end of Spectacle Island, W. ½ N.; East point of Beach Island, S.W. by W. ¼ W.; North point of Buck Island, S.W. ¼ W., distant half a mile.

The middle of the Western entrance to Buck's Harbor bears from the light N. by E. ¼ E.

The Eastern entrance N.E. by N. ½ N., distant 2½ miles. From Pumpkin Island down the Reach, giving the North point a small berth, the course is E.S.E., leaving the Triangle Ledges on the port hand, and Pulpit Ledge and Howard Ledges on the starboard hand.

Pulpit Ledge.

Pulpit Ledge lies about E.S.E. ¼ E. from the light, distant three-eighths of a mile, N.N.E. of a detached rock off the Deer Island shore, which resembles a pulpit, and has about 5 feet at low-water.

Howard Ledges.

Howard Ledges lie about 1½ mile to the S.E. by E. from the light. There is a channel inside of these ledges which is seldom used. The mark for bringing up with them is Captain Gray's two chimneys in range.

The main ship-channel is to the Northward of the Triangles, which must be left on the starboard hand in going down the Reach. Vessels coming by Hog Island must keep on a N.E. course. Vessels coming by Cape Rosiere, after getting Conder's Point, on the Western entrance of Buck's Harbor, to bear N.E., must run for it until up with or have passed the middle of the head of the Reach, which will take them to the Northward of the Triangle Ledges, between which and Buck's Harbor, on North shore of the harbor, there is good water and free from dangers.

The port hand, on the North side of the Reach, must be kept on board. Run S.E. for a tolerably high bluff point, called Bayard's Point, which should be given a good berth in passing, then haul in to the N.E. and anchor in a good harbor called Pleasant Cove.

If bound to Sedgwick, continue the S.E. course about 2½ miles from the bluff point, or until the village of Sedgwick is opened by the West entrance to the harbor bearing to the N.E., when haul in and anchor one-quarter of a mile from the entrance, with good bottom.

W. by S. from Carter's Point (the West entrance to Sedgwick) one-third of a mile, lies Stumpy Cove Ledge, with only 3 feet water on it at low-water. With the exception of this ledge, the North shore is pretty bold to the head of the Reach.

The Deer Island side of the Reach is not so bold until up to the Narrows or Bayard's Point, when vessels may stretch from side to side. After leaving Scott's, or the steamboat landing, going East, give the starboard shore a good berth, as there is a string of ledges well out from the shore covered at high-water.

If bound through the Reach, continue S.E. for a *red, bare ledge*, with round stones on it, called Torry's Castle. This ledge lies off the West point of the Western Torry's Island, and the water is bold on either side. It must be left on the port hand, continuing to the S.E. for a bluff, rocky point at the Eastern extremity of the Reach.

It will be necessary to look out for a ledge which is sometimes visible at low-water, called Conory's Ledge, which lies S.S.E. of Torry's Castle, and N.W. by N. of Conory's Island.

Conory's Island.

Conory's Island is large, and lies off the Eastern end of Deer Island. To go clear, keep Eaton's house in range with Torry's Castle. Eaton's house is the first one seen to the Eastward of Bayard's Point.

In running for the bluff point before named, called "Dutch City," a large number of islands will be left on the port hand, which may be passed close to.

After passing Conory's Ledge, stand two-thirds of the way to the Deer Island side, until near the lower end of the Reach or "Dutch City," when it will be necessary to keep a good lookout for ledges which lie off "Dutch City," and about midway, known as Half-Tide Rocks, being visible at half-tide.

The S.E. course should be continued by "Dutch City," and until the Southern Mount Desert Hill is brought out by the South point of Harbor Island, when haul to the Eastward for Mahony's Island, leaving it on the starboard hand if bound to Blue Hill, Ellsworth, or Mount Desert.

Light.

Edgemoggin Reach.—A light will be shown on and after January 2d, 1857, on Fly or Green Island, near the Eastern end of Edgemoggin Reach. It will be a fixed

white light, on a tower 25 feet above the level of the sea, and should be seen about 7 miles.

Buoys.

Buoys as they are passed by vessels entering Edgemoggin Reach from the Westward or Southward.

On Two-Bush Ledge is a Red and Black striped spar buoy.

" Heron Island Ledge	Black	do.	No. 1.
" Merriman's "	Red	do.	" 2.
" Triangles	Red	do.	" 4.
" Howard Ledges	Red	do.	" 6.
" Eastern Half-tide Rock	Red	do.	" 10.

Bunker's Ledge.

BUNKER'S LEDGE, on which is built a stone beacon, with a cask placed upon a staff in its centre, bears from the Eastern end of Sutton's Island E. ½ N., distant about one mile, which you leave on your starboard hand. You may near the ledge within 2 cables' length. When the light on Baker's Island is entirely obscured behind the Eastern point of Cranberry Island, you are then to the Westward of Bunker's Ledge; and should you have a head wind, you may stand to the Northward until the light on Bear Island bears W. by N. In running for Bear Island light, you may near Bunker's Ledge within one cable's length, leaving it on your starboard hand. After passing the light one-quarter of a mile, you may anchor, with the light bearing from E. to E.N.E., in 12 fathoms, good holding-ground; or you can run for N.E. Harbor, about one mile to the Northward of the light.

N.W. by W., distant half a mile from Bear Island light, lies a ledge, bare at low-water having on the Western edge a spar buoy painted black, which you leave on your starboard hand. Said ledge bears from the centre of N.E. Harbor S. ½ W.

Sutton's Island lies near the centre of the passage, but the best water is to the Northward of it. If you wish to go to the Westward of it, when between Bunker's Ledge and Cranberry Island, steer W. by S. until Sutton's Island *Eastern point* bears N.E. You can then anchor, or run further in, into Hadlock's Harbor, to the south of you or steer W.N.W., distant about 3 miles, for S.W. Harbor.

Bunker's Ledge bears from Baker's Island light N. by W., distant about 4 miles. Bear Island light bears from Bunker's Ledge W. by N. ½ N., distant about 3 miles. The middle part of Cranberry Island bears from Bunker's Ledge S.S.W., distant 1¼ mile.

Light.

Baker's Island and Cranberry Island form the Western side of the entrance of the passage to Bear Island, and are covered with spruce-trees. The light on Baker's Island is located near the centre of the island, elevated 70 feet above the level of the sea, exhibiting a fixed light, and may be seen a distance of 15 miles in clear weather.

A *bar* extends from Baker's to Cranberry Islands, covered at high-water, which is often mistaken by strangers for the passage going into Cranberry Island Harbor.

You must always recollect that before entering Cranberry Island Harbor the light on Baker's Island will be entirely obscured behind the Eastern point of Cranberry Island.

You may go in on either side of Bunker's Ledge; but strangers should leave it on the *starboard hand*. Between Herring Cove and Bear Island light, near the North shore, there are several rocks and ledges covered at high-water.

S.W. Harbor.

S.W. HARBOR.—This is one of the best harbors on that coast. As many as 40 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 port hand. This will bring you up midway, between the Great Cranberry and Mount Desert; 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 port 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.

High-water.

Off the S.W. point of Cranberry Island there is a rock, bearing West, distant three quarters of a mile.

Light.

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 Desert.

HULL'S COVE, MOUNT DESERT.—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 of Hull's Cove, leaving a dry ledge on your starboard hand, where you may anchor in 3 fathoms, one-quarter of a mile from the shore.

Bass Harbor.

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 port 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 port hand best on board. When you get over this bar, you steer E. by S. till you bring the S.W. entrance of Mount Desert 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 port 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 Desert, making a good roadstead for all winds but Easterly. *Cranberry Islands.*

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 Petit Manan light. *Baker's Island. Light-house.*

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 7 leagues, when you will be up with Robertson's Island, leaving the Ship and Barge on your port 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. *Blue Hill Bay.*

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. *Isle-au-haut.*

SADDLE BACK LEDGE is a high black rock, formed somewhat like a saddle, on the S.E. end of which is erected a light-house, built of hewn granite, and of that color. It is elevated 40 feet above the level of the sea, exhibiting a fixed light, and may be seen in clear weather a distance of fifteen miles. You may near it on all sides within one cable's length. *Saddle Back Ledge. Light.*

About two miles N.W. by W. from the light lies a small sunken ledge, which breaks at low tides, with a little motion of the sea.

The Southern head of Isle-au-haut bears from Saddle Back light S.E. by E. ½ E., 2½ miles distant; Seal Island, S. by W., about 15 miles; Wooden Ball Island, S.W. by S.; Matinicus Island, S.W. ¼ W., 18 miles; Brimstone Island, W. ¼ N., 2 miles; Little Isle-au-haut Harbor, N.E. by E. ½ E., 6 miles distant; Eagle Island light, N., distant about 20 miles; Fox Island Thoroughfare, N. by W., distant about 15 miles.

Isle-au-haut and Deer Islands form the Eastern side of Isle-au-haut Bay, Brimstone and the Fox Islands the Western side. The bay is about five miles in width, and Saddle Back lies near its centre.

In making Saddle Back light, coming from sea, bring it to bear from N.W. by N. to N. by W., and run it close aboard, leaving it on your port hand. If you are bound up the bay, bring the light to bear S., and steer N. for Eagle Island light, which you may near within one cable's length, by leaving it on your port hand. After passing Eagle Island light, steer N.N.W., about 8 miles, which course and distance will bring you up with Channel Rock, which you leave on your starboard hand. Give it a berth one-eighth of a mile, and steer N. by E., about 13 miles for Dice's Head light. In running this course you will pass Cape Rosier, a high bluff, which you leave on your starboard hand. When up with Dice's Head light, if you wish to go into Castine, or up the Penobscot, follow the directions given.

Channel Rock may be known by its being a small rock of a yellowish cast, lying to the Westward of a small group of islands, and may be seen at all times above water.

N. B. In coming from sea, and bound for the Isle-au-haut Bay, you leave the Wooden Ball and Seal Islands on your port hand. The Seal Island is the Eastermost island, and you may near it within three-quarters of a mile.

In coming from the Westward, and intend going to the Northward of Matinicus Island, and are bound for Saddle Back light, bring it to bear E.N.E. and run for it: follow the directions before given.

Wooden Ball Island bears from Seal Island E.N.E., 3½ miles distant; Wooden Ball from Matinicus Rock Light, N.N.E., 7 miles distant; Seal Island from Matinicus Rock light, N.E. by N., about 4 miles; from Matinicus Island, N. 3½ miles distant.

Matinicus Island. Lights. 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. There is a bell on this rock, which is rung by machinery.

Penobscot Bay and River. 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 *Light-house.* a fixed light, 147 feet above the level of the sea; thence by Camden on the West and Cape Rosier 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 Rosier 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. PENOBSCOT RIVER.—From Seguine to Manheigen, the course is East; but you must not bring Seguine to bear W. until you have passed Bantan Ledge, as it bears E., about four 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 port, and Mitinick on your starboard hand. The latter is foul. There are two rocks off George's Island, 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 Mitinick 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., half 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 port 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 port. 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 *Light-house.* starboard, and Negro Island, on which there is a light-house, on your port 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 it is bad to find in the night, the land back being higher than that in front of *Light.* the harbor. A light has been put on Grindle Point, at the entrance of Gilkey Harbor. It is in a tower on the keeper's house. 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 port hand. If you wish to harbor in Cape Jellison, you enter with Brigadier Island on the port 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, 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 port hand, called Fort Point Cove. There is one small rock near Sandy Point, on which there are about seven 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. three-fourths 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 port hand. The point on the opposite side of the bay is called Drachm Point, from which a flat extends three-fourths the distance across to Marsh River, on the end of which a buoy is placed. Should you not see the buoy, shut Picard's Point, on McKenzie's Point, a handspike's length, and run until you fairly open the reach to Oak Point. Picard'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. one-third of a mile. Thence to Mill Creek, N. by E., one 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. ½ mile. Thence to Higgins', N.N.E., one-fourth of a mile. Thence to Bragdor's Castle, N.E., three-fourths of a mile. Thence to Crosby's, N.N.E., 2 miles. Thence through Crosby's Narrows, N.E., half a mile. Thence to Crosby's Old Wharf, N.N.E., one-third of a mile. Thence to Brewer village, E.N.E., 2 miles. Thence to Mitchell's Steam Mill, N.E. by N., one-fourth of a mile. Thence to High Head, N.E., three-fourths of a mile. Thence to Bangor, N.E. by N., three-fourths of a mile.

Light-house.

Log buoy.

Buoy.

Or, bound up Penobscot Bay, leave Manheigen on the port hand from one to two miles distant, and steer E.N.E. for Green Island; when up with the Eastermost island, giving it a berth of one mile, steer North for Owl's Head; then N.N.E. for Castine, as before directed. A light has been put on Indian Island, at the entrance of Goose River: it is in a tower on the keeper's house.

Light.

Fox Island.

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. It stands two rods from the shore, and is 42 feet high.

Passage.

Light.

Fiddler's Ledge bears from the light W. ¼ 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 1½ 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 1½ mile.

In running from Owl's Head light for Fox Island thoroughfare, bring the light to bear W., and steer E. ½ 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 port hand, and Dog Fish Ledge on the starboard, which is separated by a channel 1½ 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. ½ 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 7½ 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 port hand, near a mile to the W.N.W., which lie off the Dumplins. These Dumplins are three islands, which you leave on your port 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 2 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 port 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.

Heron Neck Light. HERON NECK LIGHT is a fixed red light, 92 feet above the level of the sea, on the South point of Green Island, (the Southernmost of the Fox Islands in Penobscot Bay.) It can be seen 15 miles.

The following magnetic bearings have been taken from the light-house, viz:

To the East end of Seal Island,	S. by E. ¾ E.,	distance	13	miles.
" West " Wooden Ball Rock,	S. ¾ W.	"	12	"
" Bay Ledge (3 feet at low-water,)	S. by W. ¼ W.	"	3½	"
" Matinicus Rock Light,	S. by W. ¼ W.	"	15	"
" Heron Neck Ledge (dry,)	S. by W.	"	⅛	"
" West end of Matinicus Island,	S.S.W. ½ W.	"	11	"
" Hurricane, or Deadman 's Ledge, covered at high-water,	W. by S.	"	½	"
" Saddleback Light-house,	E. by S.	"	7	"

The whole distance, from Heron Neck Ledge to Otter Island, Brimstone Island, and Saddleback light, is full of sunken ledges.

Camden Harbor. CAMDEN HARBOR.—North-east Ledges bear from the light on Negro Island, at the mouth of Camden Harbor, N.E. ¼ N., distant about three-eighths of a mile. North-east Ledges to Morse's Point, N. by W., distant about half a mile; these 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. ½ 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. ½ S., distant about 1¼ mile. From the light to the Graves, S. by E. ½ E., distant about 2 miles. Owl's Head light bears from Camden light S. ½ W., distant about 12 miles. From the Graves to the Owl's Head light S. by W. ½ W., distant about 10 miles.

Light-house. 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. ½ 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 port hand one cable's length, and steer N.W. by N. ½ N., or N.N.W., distance nearly half a mile, and anchor near the North shore, in from 4 to 5 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. 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. ¼ W. from Fort Point ledges, and from the Eastern end of Long Island, S.E. by E. ½ E. The shore near the light-house is bold.

Castine. CASTINE.—The beacon on Otter Rock bears from the light-house on Dice's Head, at the entrance of Castine Harbor, S.E. ¼ E., distant half a mile; Noddle's Island Point, S.E. ½ S., distant about 1¾ mile; Bull Head, on Holbrook's Island, South, distant about 2 miles; Turtle Head, W.N.W., distant about 4½ 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. ¾ 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.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 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. *Beacon*

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. Stubb's Point Ledge, on which there is a beacon erected, lies opposite to the town, but is not in the way of vessels going into Castine Harbor. *Beacon.*

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 half a mile of it, then steer E. by N. for the beacon on Hosmar's Ledge, leaving Otter Rock Beacon on the port 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. ¼ E., distant 35½ 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 7 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 port 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 port hand, and anchor in about 5 or 6 fathoms, good holding-ground. *White Head.*

White Head light is 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, 70 feet above the level of the sea. Attached to this light is a bell, weighing 600 lbs., striking in foggy weather 12 times a minute. The light is small, but of great importance, as all vessels bound to Penobscot Bay, going inshore, are obliged to pass by the light through the Muscle Ridges. A stranger wishing to pass the light must, 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, as 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 anywhere off the light, in from 12 to 20 fathoms of water. If the wind takes you at N.E. and ebb-tide, that you cannot get into Sail Harbor, you may run into Tenant's 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. *Light.* *Bell.*

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. *Sail Harbor.*

TENANT'S 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 N.N.W. from said Head, one mile distant, but within it, a pistol-shot from the shore, safe navigation. In going in, you must give the port 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. *Tenant's Harbor, Muscle Ridge, and Penobscot Bay.*

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 port 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 E. for the Owl's Head, leaving two islands on your starboard hand; but when you

draw near the port shore, you steer about E.N.E. for the Owl's Head, which has a good harbor on the port 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 port hand, keeping the 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 2 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 7 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 port hand, which island has a good harbor, and if you mean to go into it, you must leave it on your port 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 port 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.

On Fort Point Ledge there is a stone beacon with a wooden spindle. (See list below.)

If you are bound up Penobscot, from Old Fort Point, with the tide of ebb, and the wind ahead, 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 6 or 7 fathoms, good holding-ground.

Beacons and buoys as they are passed in entering Penobscot Bay.

Buoys.

On Old Man's Ledge is a.....Black wooden buoy.
" South Breakers.....Red nun buoy, No. 2.
" Yellow Ledge.....Red iron spindle—copper cylinder on top.
" Lower Gangway Ledge.....Red and Black iron can buoy.
" Hay Island Ledge.....Black spar buoy, No. 3.
" Burnt Island Ledge.....Black do. do. " 5.
" Hurricane do. .....Red do. do. " 6.
" Garden Island (sunken ledge).....Black do. do. " 7.
" Otter Island Ledge.....Black iron spindle, copper cylinder, and 2 red balls on top.
" Garden Island Ledge.....Black do. do. one red ball on top.
" Ash Island Ledge.....Black spar buoy, No. 9.
" Gangway Ledge.....Red and Black iron can buoy.
" Sheep Island Bar.....Red spar buoy, No. 8.
" Dodge's Point Ledge.....Black iron spindle, cylinder on top.
" Owl's Head Ledge.....Black iron can buoy, No. 13.

PENOBSCOT RIVER.—On Brigadier Island is a Black spar buoy, No. 1.
On Fort Point Ledge.....Gray square stone beacon.
" Fort Point Reef.....Black spar buoy, No. 5.
" Sand Point.....Black do. do. No. 7.
" Odone's Ledge.....Gray square stone beacon.
" Frankfort's Flats.....Red spar buoy, No. 2.
" Buck's Ledge.....White wooden spindle, small cask on top.

On Old Fort Point, above Castine, there is a fixed white light, 105 feet above the sea, 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 port hand, which are above water. When you pass Orphan Island, you may anchor to the N.W. of it, on your starboard hand as you go through; but if the wind and tide are in favor, you may proceed up to Marsh Bay, keeping the port hand best on board. Marsh Bay is about 2 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 till 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 port 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, 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 winds.

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 port 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. *Tide.*

MANHEIGEN LIGHT.—On Manheigen Island, South of the entrance to George's River, is a revolving light of the natural color; time of revolution one minute, elevation 175 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. *Manheigen 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, and is a fixed light, varied by flashes. The tower is of brick, painted white, and the dwelling-house is painted brown. The lantern is painted black. *Franklin Island light.*

The centre of the light is 35 feet above the ground, and 54 feet above the level of ordinary high-water. It is visible, in good weather, at the distance of 12 nautical miles.

The following compass bearings have been taken from the new light-house, viz:—

Seguine light-house,	S.W. by W. ¾ W.,	distant	22 miles.
Pemaquid Point light-house,	W. by S. ½ S.	"	8 "
Marshall's " " "	E. ½ N.	"	6 "
Manheigen " "	S. ¾ E.	"	9 "

PEMAQUID POINT LIGHT, on the South end of Pemaquid Point, is a fixed light, 75 feet above the level of the sea. It is a guide to Bristol, Waldoborough, Friendship, and John's Bay, and bears N.W. ½ W. from Manheigen light, distant 12 miles. *Pemaquid Point light.*

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. by E. for Otter Island, 4 miles distant, and continue until within one-quarter of a mile of it, leaving it on your port 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. *George's 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. *Ledges.*

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 Pemaquid Point light one league, distant, on which are 5 feet 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 Pemaquid Point, 2 leagues distant, and W. by S. from Franklin light, one league which you leave on your port 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.

From the Eastern Egg Rock there is a chain of breaking ledges, extending nearly to Franklin Island. Vessels beating in will avoid these rocks by not standing too far to the Eastward.

To the Northward of the range of Pemaquid 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.]

Buoys.

Buoys as they are passed by vessels entering George's River.

On New Harbor Ledge is a Black spar buoy, No. 1.
" Jenk's Ledge,.....Red " " " 2.
" Goose Rock,.....Red & Black "
" Gay's Cove Ledge, ...Black " " 3.
" Fullerton's " .....Black " " 5.

John's Bay Harbor.

JOHN'S BAY HARBOR.—John's Island bears from Thrum Cap Island N.N.E., distant about 3 miles. Thrum Cap Island is a small bare island, and forms the Western side of the entrance of John's Bay, bearing from Pemaquid Point W.S.W., distant about 2½ miles. Pemaquid 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 Pemaquid, 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 2 miles; McFarling's Point, N.W. by N., distant about 1½ mile—one-eighth of a mile from McFarling's Point there are several ledges, covered at high-water, but they 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 the sea;—M'Coun's Point from John's Island, North, distant about 1¼ mile; Pemaquid Point, S. by E., distant about 3 miles; Pemaquid Harbor, N.E., distant about half a mile. Thrum Cap Island bears from White Island N.E., distant about 2 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 Pemaquid 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 port 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, falling in with Manheigen Island, and wishing 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 Pemaquid 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 Pemaquid; 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 and M'Coun's Point on your starboard hand; Butford's Island, Stuart's Island, and McFarling's Point, on the port 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 port 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.

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 3¼ 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 to 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.

Buoys.

Buoys as they are passed by vessels entering Damariscotta River.

On Heron Island Ledge is a Red spar buoy, No. 2.
" Western Ledge .....Black " " " 1.

On Eastern Ledge is a.....Red spar buoy, No. 4.
" Kelsey's " .....Red " " " 6.
" Bantam " .....Red can " " 8.

Incoming 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 port hand, you will see Hodgson's mills on the Western side of the river, about 1½ mile. Hodgson'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 Bantan 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 port hand, keeping Cauldwell's Island close on board. Gay's Cove lies on your port hand, about 8 miles to the E.N.E. of Franklin 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 2 hours' flood, keeping your port 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.

A spar buoy, painted white, has been moored N.W. about 400 feet from Bantan Ledge, in 6 fathoms water, bearing from Burnt Island light, in Townsend Harbor, S. by W., distant about 8 miles. *Buoy.*

SEGUINE LIGHT-HOUSE is on an island near the mouth of Kennebeck River, 200 feet above the level of the sea, and is 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: Five Fathoms Ledge, S.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., 1¼ mile; and White's Ledge, with 8 feet on it, bears N.E., one mile. *Seguine Light-house.*

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. *Marshall's Point light.*

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 one mile; Bradford's Island, W. by S., distant half a mile; Gunning Rock, S.E. by S. ¾ S., distant about one 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; Mosquito 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. *Herring Gut Harbor.*

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 port hand; Mosquito Island, Green Island, Two Brothers, and Gunning Rock on your starboard hand. Give the light a berth of 2 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 anywhere between Marshall's Point and Bradford's Island.

You may run into the harbor by bringing the light on Marshall's Point to bear W. N.W., leaving the Green Island, Two Brothers, and Gunning's Rock on the port hand, Mosquito 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 port 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 port hand, and three or four islands and ledges on the starboard hand. When you pass these ledges and Mosquito Island, 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 port hand, and be careful of a sunken rock that lies S.E. from the Eastern White Head, about one cable's length distant, on which is a buoy. 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, on which is a buoy, 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 Potato 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 Potato 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 port 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 2 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 port hand, that lies E. by S. from an island, which you leave on your port 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 or 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 port 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 port 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. one 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 2 miles wide at Channel Rock, which is always above water.

Sunken rock.

Sunken rock.

Sunken rock.

Sunken ledge

Rocks.

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 port 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

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 port 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 port 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 port hand, with a cove to the Westward of you, in 3 or 4 fathoms, muddy bottom. *Rocks.*

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 7 leagues, through a fair open sound, for White Head light, leaving George's Islands (which are three in number) on your port 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 port 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. *Townsend to Manheigen Harbor.*

If you are bound to the Eastward of 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 Tenant's 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 to the harbor is North. Having passed this harbor, you will run about 2 miles, keeping your course N.E. by N., when you will pass an island with burnt trees on it, which you leave on your port 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. *Ledge.*

TOWNSEND HARBOR.—The entrance of Townsend is wide. From the Cuckold's to the Damiscove Islands, is about 3 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 2 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. *Townsend Harbor.* *Light.*

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 port 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 port 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 anywhere inside of Mouse Island, as there are neither rocks nor shoals lying off from the land. *Light.*

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 port bow till you get up with it, then steer N. by E., and follow the directions before given in coming from the Westward.

Kennebeck. 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, on which there is a black nun boy, No. 3, with J. K. in white letters, 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 2¼ miles. Leaving Pond Island a cable's length on the port 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., one-half mile from Pond Island,) upon which the tide sets very strongly. On Pond Island Reef there is a black cast-iron nun boy, No. 5. 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 Cox's Head (on which also is a fort,) one mile. The course is then N.E. to Perkins' 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 Perkins' Flats, in 4, 5, and 7 fathoms. This is as far as it would be prudent for a stranger to attempt with a heavy vessel. On Perkins' Ledge there is a spar buoy, with black and red horizontal stripes.

Light.

Sunken ledges.

There is a good anchorage in moderate weather anywhere 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 fallen 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, anywhere between Small Point and Seguine, avoiding Jack-knife Ledge, before mentioned.

Safe anchorage may be had from Cox's Head to Perkins' Island, nearest the Eastern shore. The usual rapidity of the tide, between the Seguine and the mouth of the river, is 3 and 4 knots.

Tide.

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.

Buoys.

Buoys arranged as they are passed by vessels entering Kennebeck Harbor.

On Thom's Rock is a.....Red nun buoy,...No. 4.
" White's Ledge,.....Black nun buoy,.. " 1, W. L. in white letters.
" Jack-knife Ledge,..... Do. do. .. " 3, J. K.
" Pond Island Reef, ... Do. do. (iron). " 5.
" Black Jack Rock,.....Black and red spindle, with iron cage on top; the shaft, red; top, red and black stripes.

The buoys on Thom's Rock and White's Ledge will not be seen by vessels entering the Kennebeck West of Seguine.

Buoys arranged as they are passed by vessels entering Kennebeck River.

On Perkins' Ledge, is a spar buoy,..Black and red horizontal stripes.
" Parker's do. .....Black spar buoy, No. 3.
" Seal Rock,.....Black spindle, with copper cylinder, painted black.
" Lee's Rock,.....Red spindle, like the above, with red ball on top.
" Ram's Island Ledge, ... Do. with 2 red balls on top.
" Lithcoe's Rock, ...Black spar buoy, No. 5.
" Lincoln's Ledge, ... Do. " 7.
" Trufant's Ledge, ... Do. " 9.
" Winslow's Rocks, ...Red spindle, with red cask on top.
" Stetson's Rocks,.....Red spar buoy, No. 2.
" Thorne's Island Rock .....Black spar buoy, " 11.
" Grace's Rock,.....Red spar buoy, " 4.
" Trott's Rock, ...Black spar buoy, " 13.
" Twing's Rock, ... Do. " 15.

Buoys arranged as they are past by vessels entering the Main-channel, Kennebeck River. *Buoys.*

On Hawthorn's Rock is a	Red Spar buoy,		No.	14.
" Naumkeag " "	Do.	do.	"	16.
" Hill's Ledge "	Do.	do.	"	18.
" Green's do., East "	Do.	do.	"	20.
" Do. do., West "	Black	do.	"	15.
" Dearborn's Shoal "	Red	do.	"	22.
" Grant's Ledge "	Black	do.	"	17.
" Brown Island Shoal "	Do.	do.	"	19.
" Basell's Flats "	Red	do.	"	24.
" Shepard's Pt Shoal "	Black	do.	"	21.
" Mill Bk (Lr. Shoal) "	Do.	do.	"	23.
" Do. (Up. do.) "	Red	do.	"	26.
" Willow Tree Shoal "	Do.	do.	"	28.
" Hinckley's Rock "	Black	do.	"	25.
" Brett's Shoal (Lr. end)	Do.	do.	"	27.
" Do. do. (Up. end)	Do.	do.	"	29.
" Gray's Brook is a	Do.	do.	"	31.

All buoys in the Kennebeck River, above Bath, are taken up in the winter, and replaced in the spring.

HENDRICK'S HEAD LIGHT is a revolving light, 30 feet above the level of the sea, on the starboard hand going in, near the mouth of Sheepscut River. *Hendrick's Head Light.*

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 3 leagues, leaving three dry ledges on your starboard hand, and one on your port. 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 Captain Smith's wharf, where there 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 port 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 port hand, if it is low-water, which is covered at high-water; you may anchor at 8 fathoms to the Northward of it. *Sheepscut River.* *Sunken rocks.*

MARK ISLAND.—On Mark Island a stone column is erected as a landmark 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 column 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. *Mark Island.*

Bearings by compass, and distance in statute miles from the column. *Bearings.*

To the column on Cape Elizabeth	S.W. ½ W.	13	miles.
" the Outer Green Island	S.W. by W.	6	"
" Half-way Rock	S. by W. ¼ W.	4	"
" Drunkard's Ledge	S. ¼ W. to S. ½ W.	1½	"
" Mark Island Ledge	S.E. ¼ S.	¾	"
" South Pilot of Jaquish	E. ½ S.	1½	"
" Turnip Island	E. ¼ N.	1¼	"
" Cape Small Point	E. by S.	10	"
" Whale Rock (out of water)	S.W. by W.	½	"
" Haddock Rock or Island (N. point)	N.W. ½ W.	½	"
" S.W. point of Haskill's Island	N.N.W.	⅓	"
" Middle of Eagle Island	W.N.W. ½ W.	1¼	"
" Mackerel Cove	E.N.E.	2	"

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 port 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 2 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 2 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.

Tide. It is high-water here, at full and change of the moon, about 10h. 45m.

New Meadows. NEW MEADOWS.—This river bears N.E., 8 leagues distant from the pyramid on Cape Elizabeth, and W. about one league distant 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 2 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 port 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 2 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. There is a black spar buoy on Jameson's Ledge, and a black and red striped one on Gorley's Ledge, both in 18 feet, low-water.

Hussey's Sound. HUSSEY'S SOUND.—If bound into Hussey's Sound, give Cape Elizabeth a berth of a quarter of a mile, and steer N., which will bring you up to the sound, about 9 miles distant. When up with the sound give the N.E. outer point of Peak's Island a good berth, as a reef extends E.N.E. nearly half-way across the passage, and breaks in heavy weather. Then giving Overset Island a small berth, as its shores are very bold, continue your course midway the passage N. by W. or N.N.W., up to Cow Island, about 2 miles distant, thence steer N.E. by N. about a half or three-quarters of a mile, and anchor between Clapboard Island, which is a high island, covered with trees, and the centre of Long Island, bringing Clapboard Island to bear N.W., and centre of Long Island S.E. The anchorage is good holding-ground, in 5 or 6 fathoms at low-water. You will then have Little Lebeig Island to the N.E., and Hog and Cow Islands to the S.W. This anchorage is about 6 miles from the wharves in Portland Harbor. The flood-tide sets strong into, and the ebb out of Hussey's Sound. Here 500 sail may be moored safe from all winds and weather, and when wind and tide serve, they can be taken to sea in half an hour.

Good anchorage can also be had between Little Crow Island, at the N.E. end of Peak's Island and Great Hog Island, in 6, 8, or 10 fathoms, good holding-ground.

S.E. from Little Crow Island, 50 fathoms distant, there is a sunken ledge, having only 12 feet on it at low-water, which will be avoided by keeping the starboard shore of Hussey's Sound best on board.

Half-Way Rock. 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. Seguine light-house bears from the rock E. ½ N., distant about 12½ miles; Drunken Ledges, N.N.E., distant about 2¼ miles; Mark Island, N. by E. ½ E., distant about 4½ miles; the light-house on Cape Elizabeth,

Light-house.

S.W. by W. ¾ W., distant about 9 miles; Bulwark Reef, (shoalest part,) S.W. by S., distant about 4½ miles; Portland light-house, W. ½ S., distant about 7½ miles; Green Islands, W. ½ N., distant about 4 miles; Jewill's Island, N.W. by N., distant about 3 miles; Eagle Island, N., about 4½ 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 1½ mile.

Webster Rock.

WEBSTER ROCK.—About a quarter of a mile N. by W. of the centre of Half-way Rock is a small rock with but 8 feet on it at lowest tides, and 10 fathoms inside of it. On this rock the steamer Daniel Webster struck in October, 1856. A spar buoy will be placed upon it.

Portland Harbor.

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 one minute and thirty seconds, the Eastern is a fixed light.

Lights.

Dangers in approaching Portland Harbor.

Bulwark Ledge.

BULWARK LEDGE is about half a mile in circumference, and has on the shoalest part of it 15 feet at low-water, which gradually deepens from 3 to 12 fathoms. It bears from Portland Head light E.S.E., 6¼ miles; from Cape Elizabeth Eastern light, E. by N. ¼ N., 6 miles, and from Green Island, S.S.W., 5 miles; it breaks in heavy weather. There is on it a nun buoy, red and black horizontal stripes, one-eighth of a mile S.E. of the shoalest water.

Alden's Rocks.

ALDEN'S ROCKS are two in number, bearing from each other E.S.E. and W.N.W.; the distance between them 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 7 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 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.

Alden's Rock buoy is a black spar buoy, No. 3; it is 450 feet North of the shoalest part of the ledge, and bears from Cape Elizabeth East light S.E. by E., 3 miles, and Portland light S.S.E. ¼ E., 6¼ miles.

Alden's Rock bell buoy bears from the spar buoy N.W., one-quarter mile; Cape Elizabeth light, S.E. by E., 3 miles; Portland light, S.S.E. ¼ E., 6¼ miles.

Buoys.

Spring Point Ledge has a Black spar buoy, No. 11, in winter, and a nun buoy in summer.

Stamford's do.	do.	"	"	"	13.
East end of Middle Ground..	Red	"	"	"	4.
Middle Ground.....	Red	"	"	"	6.
Green Island Reef.....	Red	"	"	"	2.
Whitehead Ledge.....	Black wooden spindle, basket top.				

Light.

There is a fixed red light on the end of the breakwater, Portland Harbor.

Hue and Cry.

HUE AND CRY has a black spar buoy, marked 1. From it Eastern Cape Elizabeth light-house bears N.W. by N., distant 4 miles; Alden's Rock buoy, N. ½ W., distant 2 miles. It is in 36 feet, low-water, is 125 feet E.S.E. of the ledge, which has 16 feet on it at low-water.

Vapor Rock.

VAPOR ROCK.—This rock lies N. by W. ½ W., 3 miles distant from Cape Elizabeth Eastern light, and N.W. by W. ½ W., 3 miles distant from the barn on Richmond's Island.

Vessels should not pass inside of Alden's Rock, unless well acquainted, or having a pilot, although the deepest channel is inside of it. This bears from Eastern Cape Elizabeth light-house, E. by N. ¼ N., distant 2½ miles; from Wood Island light-house, S. by E. ¾ E., distant 9¼ miles.

Old Anthony Ledge.

OLD ANTHONY LEDGE bears from Eastern Cape Elizabeth light-house S. by E. ¾ E., 2¼ miles distant; from Wood Island light-house, E. by N. ½ N., 9½ miles distant, and has 22 feet on it at low-water.

On the East end of the Middle Ground, Portland Harbor, is a red buoy, No. 4, in 17 feet, water at low-water; which bears from the shore end of the breakwater N. ½ E., and from the observatory S.E. ½ E.

On the West end of the Middle Ground is a red buoy, No. 6, 16 feet water at low-water which bears from the shore end of the breakwater N.W. by N. ¼ N., and from the observatory S.E. by S.

Taylor's Reef. TAYLOR'S REEF bears from Eastern Cape Elizabeth light-house S. by E. ½ E., distant three-quarters of a mile; from barn on Richmond's Island, E. by N., 1½ mile. It has 8 feet over it at low-water.

Broad Cove Rock. BROAD COVE ROCK has a black spar barrel buoy, replaced in summer by a nun buoy, marked B. C. R. From it Cape Elizabeth light-house bears S.W. ½ S. 1¼ mile; Portland Head light-house N. ¾ W., 2¼ miles. It has 24 feet water, and lies to the Northward of a shoal which has 16 feet water on it, and to the Southward of Trundy's Reef buoy.

Trundy's Reef. TRUNDY'S REEF has a black spar buoy, replaced by a nun buoy, marked T. R., in summer. Cape Elizabeth light-house bears S.S.W., 2¼ miles; Portland Head light-house, N.N.W., 2¼ miles. It has 24 feet on it at low-water.

Bell Rock. BELL ROCK has a spar buoy, red and black horizontal stripes. From it Portland Head light-house bears N.W. by W., distant 1⅛ mile; Eastern Cape Elizabeth light-house, S.E. by S. ½ S., distant 4¾ miles. It is in 42 feet, at low-water, and is 150 feet South-east of the ledge, which has 18 feet over it at low-water.

Bearings. 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.:

S.E. side of Richmond's Island	S.W.	2¼ miles.
Seguine light	E. by N. ¼ N.	20 "
Wood Island light	S.W. ½ W.	8½ "
Portland Head light	N. ¼ E.	3¾ "

Light-house. Portland light-house is on a point of land called Portland Head, at the Western entrance of the harbor. It is a stone edifice, 81 feet high, and is a fixed light.

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., 12 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. 19 miles, which will bring them up with the buoy.

In 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 2 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 large draught will find the best water by bringing Portland light to bear N.W. by N., and running directly for it.

Buoy. Coming from the South-westward, when within half a mile of Cape Elizabeth, the black buoy on Broad Cove Rock may be seen; it bears N.N.E. from the pitch of the cape, distant 1½ mile, and lies in 24 feet water. When up with this buoy, leave it on the port hand, half a cable's length distant, and steer N. by E. ½ E. one mile, which will carry you up with the black buoy on Trundy's Reef, which lies in 24 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. part of which bears N. from the light-house, distant about 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 18 feet water. When up with this buoy, you open the town. Giving the Spring Point Ledge buoy a small berth, you may haul up N.W. for the black buoy on Stanford's Ledge: this buoy lies in 17 feet water, one mile distant from Spring Point Ledge buoy. There is a fixed red light, 23 feet above the sea, on the N.E. point of the breakwater, Stanford's Ledge. Giving this light and the black buoy a small berth, keep midway up the river, and anchor opposite the town where you please, in safety.

Light.

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 is a red spar buoy on Green Island Reef, and a black wooden spindle with basket, upon Whitehead Ledge. This passage is narrow, and but seldom used with large vessels.

By keeping midway in coming in, you will have not less than 5 fathoms water. Keep midway the passage, leaving the Spindle half a cable's length on the port hand, and steer for the fort on House Island, passing between the N.E. end of Bang's Island, and the S.W. point of Little Pumpkin Island, which will carry you into ship-channel the same as if you had passed the light-house.

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 2 ledges of rocks, one called Spring Point Ledge, 2 miles N. by W. ½ W. from the light-house, and the other 3 miles, bearing N. by W. ½ W., called Stanford's Ledge, which has a buoy on it, and stretches off from your port 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 port 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.

Light.

Ledges.

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. ¾ W. from Portland light-house, 4 miles distant; 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:

Directions.

Give this cape a berth of one-quarter of a mile, and steer N.E. 9 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 2 islands, in about 13 fathoms water. The shores on each side are very bold.

RICHMOND'S ISLAND HARBOR.—To enter Richmond's Island Harbor, stand in by the Western extremity of the island N. ½ W., (giving the West Ledge a berth of about the eighth of a mile,) until the Western light on Cape Elizabeth is well open; then haul up until the wharf bears E., is the best anchorage for vessels of heavy draught. Vessels of lighter draught may stand in until the wharf bears S. by E.

Richmond's Island Harbor.

The anchorage is good holding-ground, being of clay, with a crust of coarse sand, from six inches to a foot in thickness.

In beating in, the only precaution necessary is to look out for the Old Proprietor and the Chimney Rock, both of which are out of water at half-tide.

In coming from the Eastward, give the island a berth of one-quarter to half a mile, until the Western extremity of the island bears N.E. by N.; then haul up N. ½ W., and proceed as above.

Richmond's Island Harbor is a safe anchorage with the wind from any point between N. and S.W., and is easily entered when vessels cannot get into Portland.

The soundings on the chart indicate the best water. No pilot is required.

Sunken ledge. 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.

White Hills. 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. They have been seen when in latitude 43° 10′ North, 23 miles South 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 N.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 Jeffery's Ledge, in 45 fathoms water, you will see the hills of Agamenticus, bearing W. by N. or W.N.W.

Betwen Jeffery'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, distance seven-eighths of a mile.

Cape Porpoise to Wood Island light. CAPE PORPOISE TO WOOD ISLAND LIGHT.—Wood Island light is situated near the entrance of Saco River, on the East side of the island. It is 63 feet above the level of the sea, and is a red revolving light. Wood Island is a high woody land, and very even, and lies N.E., 12 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 2 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 port hand.

Saco. 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.

Cape Neddock to Cape Porpoise. CAPE NEDDOCK TO CAPE PORPOISE.—Your course from Cape Neddock to Cape Porpoise is N.E., distant 43 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 port hand and three on your starboard. It may be known by the high land of Kennebunk, which lies to the North-west of it. When the harbor bears N.W., you must haul in, but be careful of the point on your port 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 2 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. Goat Island light. CAPE PORPOISE HARBOR.—The light-house stands on the South-west part of Goat Island, and contains a fixed light, elevated 38 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 Goat Island 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 Goat Island light-house S.E. by S., half a mile distant; then steer N.N.W., until Goat Island 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 port shore best aboard. When up with the points, steer N.W. a quarter of a mile, and anchor in 3 fathoms water, at low-water. By following these directions you will find from 3 to 6 fathoms water. In coming in 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. *Light.*

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 Goat Island light-house S.S.E., distant about five-eighths of a mile; Old Prince bears from the buoy N.N.E., distant about one-eighth 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. *Buoys.*

There is a fixed red light on the pier head, at the mouth of Kennebunk River. It is a small frame structure, and the lantern is placed on the outer end of the building. *Light-house.*

KENNEBUNK.—A black spar 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 the 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 one mile; Flying Point, E. by N., distant about three-fourths of a mile; Fox Point, N.E., distant about three-fourths of a mile; Boothby Point, N. by W., distant about three-fourths 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 port 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 black, 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 wind above mentioned. *Kennebunk.*

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 300 or 400 feet towards the bar, extending a little beyond low-water mark, with a flagstaff 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, 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 to 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. *Tide.*

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 shows a fixed light, elevated 133 feet above the level of the sea. *Boon Island. Light.*

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.

BOON ISLAND LEDGE 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. *Boon Island Ledge.*

The ledge bears from the island E. ¼ S., 2¾ miles 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-fourths of a mile from the S.E. point of the island.

Soundings.

The following are the Soundings around Boon Island.

Boon Island Light-house bearing				W. ½ S.	1	mile distant,	21	fathoms.
"	"	"	"	Do.	1½	" "	25	"
"	"	"	"	Do.	1¾	" "	24	"
"	"	"	"	W. ½ N.	2	" "	12	"
"	"	"	"	W. ¾ N.	2	" "	8	"
"	"	"	"	W. by N.	2	" "	18	"
"	"	"	"	W. by N. ½ N.	1½	" "	23	"
"	"	"	"	S.E. by S.	½	" "	15	"
"	"	"	"	S.E. ¼ E.	1	" "	23	"
"	"	"	"	S.E. by E.	2	" "	12	"
"	"	"	"	E. ¼ N.	4	" "	18	"

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 29 miles.

We 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.

Ledge. 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 10 feet."

York Ledge. YORK LEDGE.—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 2 fathoms at low-water.

The soundings are gradual, from 5 to 20 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 tubular 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 4 fathoms at low-water, bear S.W., 2 miles distant from this beacon.

Lights. 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,

York Harbor. YORK HARBOR.—This is a small harbor, but once entered is safe; 12 feet can be carried in at low-water; rise of tide 9 feet.

Portsmouth light-house. 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 70 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:

Kitt's Rocks buoy bears S. 25° 30′ E., one mile 2420 feet from Portsmouth light.

Idiorne's Point, S. 14° 17′ 45″ W., one mile 5120 feet from Portsmouth light.

Gun-boat shoal. 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 2 cables' length, and bears from Whale's Back light S. by W. ½ W.; from Odiorne's Point S. ½ E.

Light-house. Whale's Back light-house is situated on the East side of Portsmouth Harbor. Its height is 58 feet from low-water mark. It is a fixed light, varied by flashes.

The following are the bearings and distances of places from Whale's Back light:

Western Sister, N. 89° 41′ E., one mile 1310 feet.

Eastern Sister, N. 75° 53′ 30″ E., one mile 3480 feet.

Odiorne's Point, S. 44° 30′ W., one mile 1920 feet.

Phillip's Rocks (12 feet) S. 83° 30′ E., one mile 300 feet.

High-water. Kitt's Rock buoy, S. 23° 50′ E., 2130 feet. High-water, 11h. 10m. Springs, 12 feet.

If you fall in to the Eastward, and 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 until you bring Portsmouth light-house to bear N., and the light on Whale's Back to bear N.N.E., then steer N. ½ E., (leaving Whale's Back light on the starboard hand,) having 4 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. *Light-house.*

A black spar buoy has been placed on Cod Rock, near Fort Point, at the entrance of the harbor, in 18 feet of water. Vessels passing into the harbor, by leaving this buoy on the port hand 30 feet distant, will have 6 fathoms of water. *Buoy.*

A black spar buoy has also been placed at the ledge, at the N.E. of Amazun's, or Goat Island, in 10 feet water. Vessels passing up the harbor, by leaving this buoy on the port hand 30 feet distant, will have 7 fathoms water.

A black spar buoy has also been placed on the Eastern edge of sunken rocks, in 10 feet of water, bearing about East from the monument on said rocks. Vessels passing up the harbor, by leaving this buoy on the port hand 40 feet distant, will have 7 fathoms water.

Two spar buoys have also been placed as guides, in entering Spruce Creek Harbor, viz: a red buoy on the S.W. point of Hick's Rock, in 13 feet water, and a black buoy on Jamaica Point, (Trefethern's Island,) in 10 feet water. Vessels entering Spruce Creek Harbor, by leaving the red buoy on the starboard hand 100 feet distant, will have 5 fathoms water, and by leaving the black buoy on the port hand 100 feet distant, will have 3½ fathoms of water.

After passing the two last-mentioned buoys about 100 feet, vessels may anchor in 5 fathoms water, in good muddy bottom; and by keeping in mid-channel, and running about North, may anchor in the creek in 5 or 6 fathoms of water.

N. B.—Hicks' Rocks are under water mostly 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 Portsmouth light bears N., when you may run for it with safety. *Light-house.*

You may also, if coming from sea, and make the Isles of Shoals, and are to the Eastward of them, run for them until within one mile of the Eastern island, then steer W.N.W. until Portsmouth light bears N., then follow your directions, passing Whale's Back light on the starboard hand. Beating into Portsmouth Harbor it is not prudent to stand to the Eastward further than to bring the light to bear N. by W. ½ W, or to the Westward further than to bring it to bear N. If you are to the Westward of the Isles of Shoals, give White Island light a berth of one mile and a half, bring it to bear E., and then run N. by W. for Portsmouth light, 9 miles distant. *Bearings.*

On the East side of the entrance of the harbor lies Kitt's Rock, on which is a red buoy, and S. ½ W., one-quarter of a mile from the light-house, lie Stielman's Rocks, over which is a black buoy; both rocks are under water. Give both buoys a good berth, Kitt's buoy 200 yards, and Stielman's 100 yards, and there is no danger, as you will have full 5 fathoms water.

Between Kitt's Rock and the Western Sister, lie Philip's Rocks, occupying an area of about 500 feet by 900 feet, with 11, 12, and 13 feet water on them.

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 whence you may take a new departure, by bringing the light-house to bear E., 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.

The following list of buoys is arranged as they are passed in entering the harbor: *Buoys.*

On *Branscomb's Rock* is a red spar buoy, No. 2, Whale's Back light-house bearing W. ¼ S., 1½ mile distant.

" *Kitt's Rock* is a red spar buoy, No. 4, the above light bearing N.N.W., half a mile.

" *Frost's Point Ledge* is a black spar buoy, No. 1, the above light bearing E.N.E., half a mile.

" *Jevry's Point* is a red iron beacon, with letters L. H., the above light bearing N. ½ E., three-quarters of a mile.

" *Stielman's Rock* is a black spar buoy, No. 3, the above light bearing S.E. by S., three-quarters of a mile.

" *Cod Rock* is a black spar buoy, No. 5, Portsmouth light-house bearing S.S.E., one-eighth of a mile.

Buoys.

On *Fishing Island Ledge* is a red spar buoy, No. 6, Portsmouth light bearing S.W. by S., half a mile.

" *Logy Ledge* is a red iron spindle, copper cylinder top, Portsmouth light S.S.W., half a mile.

" *Hicks' Rocks* is a red spar buoy, No. 8, Kittery Point church E.N.E., one-quarter of a mile.

" *Trefethern's Island* is a black spar buoy, No. 7, the above church bearing E., half a mile.

" *Oliver's Island* is a black spar buoy, No. 9; the above church bearing N.E. ½ N., one mile, Navy-yard flagstaff N.W., one mile.

" *South Beacon Shoal*, is a black spar buoy, No. 11, South Beacon bearing W., one-eighth of a mile; North Beacon N. ½ W., half a mile.

" *Gangway Rock* is a red and black striped buoy; South Beacon S.S.W., one-quarter of a mile; North do. N. ½ W., one-quarter of a mile.

" *South Beacon* is a gray stone beacon, 18 feet square, 20 feet high, with black mast and lozenge-shaped figure on top.

" *North Beacon* is a red wooden mast, 25 feet high, with 4 diagonal braces, lozenge-shaped figure on top.

" *Seaward's Rocks* is a black spar buoy, No. 13, Long Wharf W., 450 feet distant.

" *Willey's Ledge* is a red iron spindle, copper cylinder, with gilt ball and vane on top; Navy-yard flagstaff E. by S., half a mile; South Beacon S.E., half a mile.

Isles of Shoals. Light-house.

ISLES OF SHOALS.—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 and 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 1¾ mile 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.

Bearings from White Island Light-house.—Portsmouth light-house bears N.N.W., distant 7½ 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 12 miles. Cape Ann lights, S. ¾ W., distant 19½ 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. Northwest 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 1¼ 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. ¼ 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 the 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.

Rock.

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. ¼ 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. *Rock.*

Between Cedar and Smutty-nose Islands, the government, a few years since, erected a 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. The West end of Smutty-nose Island bears from the meeting-house N. by E. ¼ 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. ¼ W.; East end of ditto 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. ¾ E.; the West end, N. by W. ¾ W., about 3½ miles distant.

NEWBURYPORT LIGHT is on Plum Island, South side of the entrance to Merrimack River, and is a fixed light, 54 feet above the sea. Variation in 1850, 10° W. *Newburyport light.*

Badger's Rocks bear N.W. ½ N. from the light-house, distant half a mile, and are covered at two-thirds flood, you leave them on your starboard hand. Black Rocks bear N.W. from the light-houses, three quarters of a mile distant, and are always dry, them you also leave on your starboard hand. Half-tide Rocks (on which is placed a pier) bear W. by S. ¾ S. from Black Rocks, distant 1½ mile, and are bare at half-tide, you leave them on your port hand. North Rocks (which also have a pier on them) bear W. by S. from Black Rocks, distant 1½ mile, and are seen only at very low tides, you leave them on your starboard hand, between them and Half-tide Rocks is the channel.

NEWBURYPORT HARBOR—A nun buoy, painted black and white perpendicular stripes, has been placed in 5 fathoms water at low-tide off the bar, the light bearing W. by S., distant 1¼ mile. Vessels bound in over the bar should bring the buoy in range with the light, and run for it, which will carry them over in 7 feet water at low-tide. *Newburyport Harbor.*

The Eastern light has been extinguished, and a small bug light has been substituted. In running at night the bug light and the Western light must be brought in range.

When over the bar, and half way to the shore, there will be found a spar buoy painted black, to be left on the port hand.

Then steer N.W. ¾ W. past a buoy in mid-channel, painted black and white perpendicular stripes, to the Red buoy on Black Rocks, when the course is W. ¾ S., passing a buoy off Joppa Flats, painted black, to be left on the port hand, and a red buoy on Joe Noyes' Point to be left on the starboard hand, to the upper mid-channel buoy, painted black and white perpendicular stripes; thence between the two piers up to the anchorage.

OTHER DIRECTIONS.—When you come round Cape Ann, and are two miles to the Northward of the Dry Salvage Rock, bring the rock to bear S.E., and steer N.W. by W. 3⅔ leagues, which will carry you up with Newburyport Bar. In running for the bar from the Eastward, you should not approach too near Hampton 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 Plum Island, 3 miles distant, lies another dangerous rock, having only 3½ feet water on it. If you go so further to the Westward than for the lights on Plum 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. The pilots belonging to this harbor will, if possible, be outside the bar, to take command of vessels wanting their assistance. If they cannot, keep the lights in range, and run for them until within a cable's length of the Eastern light, when 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. You should always keep *Newburyport.*

to the windward of the bar, unless the wind is 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, 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 it, you must haul up N.W., which 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 seven or eight piers, on which are from 7 to 2½ feet 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. When you pass the Black Rocks, haul up W. by S. ½ S., which will bring you in channel-way and good anchorage. And if it be night, or dark weather, when you judge yourself about half a mile from Black Rock, you may come to with safety. If you make Cape Ann lights, and wish to make a harbor, bring them or the Dry Salvages to bear S. by E., when you may run with safety N. by W., or N. ½ W., 8 leagues, to Portsmouth. On the above course you will make the Isles of Shoals, from which you take a new departure; when you pass them, bring Star Isl. and (on which the meeting-house stands) to bear S.S.E., and steer N.N.W., 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 Southwesternmost island. There is a very good harbor in the Isles of Shoals; 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 windmill on it) and Hog Island, where there is water enough for a first-rate man-of-war, and where you anchor, having 12 fathoms, muddy bottom.

When you come from the Eastward, with the wind E., or E.S.E., (with which wind you cannot weather 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 it 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.

Signals. *Signals for vessels bound to Newburyport, when 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 lie off and on at the bar, keeping to windward, until signals are 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.

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 attempt to come in over the bar during the night, a Lantern will be hoisted to the top of the flagstaff.

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 flagstaff, 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. IPSWICH.—The light-house on Ipswich Beach shows a fixed light, varied by flashes once in 80 seconds, 40 feet above the sea. 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.

Light. IPSWICH HARBOR.—There is a light, to serve as a range with the light in the Eastern tower, for crossing the bar at night. It is exhibited from a large Fresnel lan

tern hoisted at the top of a stake 15 feet high, placed near the beach. The stake is painted black.

In running in bring the stake light to range with the harbor light, and run for it. This will take you over the bar in not less than 7½ feet water at low-tide, and by the inner spit buoy in 12 feet at low-tide. After passing the buoy, the course up the harbor is N.N.W. Strangers should not rely too implicitly on this range, as the bar is a shifting one.

Buoys as they are passed in entering Ipswich Harbor. *Buoys.*

On *North Breaker* is a red spar buoy, No. 2; Ipswich light bearing W.S.W. ½ W., Annis Squam light S.E. ¼ S.

" *South Breaker* is a black spar buoy, No. 1; Ipswich light W.S.W. ¾ W., Annis Squam light S.E. ¼ S.

" *Inner Spit* is a red spar buoy, No. 4; North Breaker buoy N.E., South Breaker buoy N.E. by E. ¼ E.

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, 35 feet high, containing a fixed light, 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 8 leagues, and from Newburyport Bar S.S.E., 3⅔ leagues. *Annis Squam Light-house.*

ANNIS SQUAM HARBOR, IN IPSWICH BAY.—Masters of vessels out of Newburyport should generally be acquainted with the harbor of Squam, as it is 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., 3½ 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. Variation in 1850, 10° W. *Annis Squam Harbor, in Ipswich Bay.*

Squam Bar bears from Halibut Point (the N.E. point of Cape Ann) from W.S.W. to S.W., distant about 3½ miles. In running from Halibut Point, you must be careful of Plum Cove Ledge, which shows until near high-water, and on which there is a black spar buoy, bearing 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 port 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 black one is on Harraden's Rock, which you will leave on your port hand. The red 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 pased the red buoy 20 or 30 rods, you may run S. by W. ½ W., which will carry you close along by the monument on the Lobster Rocks, which you must leave on your port 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 port 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 in safety.

On the Lobster Rocks is a monument, 12 feet at the base, 17 feet high, built of stone, and is 7 feet at high-water. The light-house on Wigwam Point bears from the monument N.E. by N. ½ N., distant one-quarter mile; the red buoy placed outside the bar bears N. ¼ E., distant 1¼ mile; the black buoy near the Harraden Rocks bears N. by E. ½ E., distant 1¼ mile; leaving the black buoy on the port 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 port hand, and may be approached at 3 fathoms distance, and then have 2 fathoms at low-water; the red buoy, just without the harbor, lies in 15 feet at low-water, and bears from the *Monument.*

light-house N. ¾ W., and is to be left on the starboard hand: the black buoy lies in 15 feet water off the N.W. side of Harraden's Rocks, bearing from the light-house N. by E. ½ E., distant about one mile, which is to be left on the port hand. A red buoy is placed off the Plum Rock Ledges, in 3 fathoms water, and bears from Squam light N.N.E., distant 1½ mile. On Squam Bar, at low-water, there are about 6 feet. High-water, full and change of the moon, at 11 o'clock.

Sandy bay pier. SANDY BAY PIER.—If from the Southward, in passing outside Straitsmouth Island, be careful of Avery's Rock, which bears North from the Eastern part of Straitsmouth 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 Easterly, make up the headsails and keep up the mainsail, which enables them to have command of the vessels, 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 your starboard hand.

The passage through Straitsmouth Gap is not safe, except at nearly high-water, as there are but 3 feet water at low-tide, and rocky bottom.

Cape Ann Light-houses. CAPE ANN LIGHT-HOUSES are built on Thatcher's Island, which lies about 2 miles East of the South-east point of Cape Ann, and forms the Northern limits of Massachusetts Bay. The lanterns are elevated 98 feet above the level of the sea, and contain fixed lights. The lights range when bearing N. by E. ¾ E., or S. by W. ¾ W., and are about one-third of a mile apart.

Thatcher's Island Ledge bears from the body of the island from E.S.E. to S.S.E., extending about 2 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.

Seven to ten miles E.S.E. from Thatcher's Island, there are three or four small stony spots, with 10 to 18 fathoms. There are 25 and 30 fathoms inside.

Cape Ann. 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. ¾ 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.

Straitsmouth Island Light-house. If you want to go inside the Salvages, keep close aboard Halibut Point, which has a tree on the Eastern part of it, and steer S.S.E. for Straitsmouth Island, on which there is a fixed light, 33 feet above the sea; but be careful to avoid Avery's Rock, by keeping the lights on the dry points of Straitsmouth 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 Halibut 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 are very bold. Halibut Point bears from the Salvages W.N.W., 2½ miles distant; and the Salvages bear from the lights N.N.E., 3 miles distant.

Beacon. *Londoner Beacon* is a wrought iron shaft, 40 feet high, surmounted by an octagonal lattice, or open work day-mark, of cast iron, 7 feet high, and 5 feet diameter, painted black.

The following are the bearings from the beacon:

Dry Salvages, N. ¾ E.
Straitsmouth Island light-house, N.N.W.
Northern light-house, Thatcher's Island, N.W. ¼ N.
Southern do. do. do. N.W. by W. ¾ W.
Eastern Point light-house, S.W. by W. ½ W.

In sailing from Cape Ann lights to Cape Ann Harbor, you will 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 further 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, 49 feet above the level of the sea. *Ten Pound Island.*

CAPE ANN, HARBOR OR GLOUCESTER HARBOR.—Vessels approaching Gloucester from Cape Ann must beware of the Londoner, a rock 200 yards in extent, half a mile S.E. by E. from Thatcher's Island South light. There is a channel to the Westward a quarter of a mile wide, with 5 and 6 fathoms, but strangers should pass to the Eastward, not approaching the lights nearer than one mile until they bear N. W. With Thatcher's Island lights in range, bearing N. by E. ¾ E., one mile distant, steer S.W. by W. ½ W., 5 miles, until Eastern Point light bears N. nearly. Haul round the Point to the Northward and Westward, keeping half a mile off shore to clear Dog Bar and Eastern Point Ledge. *Cape Ann Harbor.*

To enter South-east Harbor bring Ten Pound Island light to bear N.N.E. ¼ E., and run for it, when within half a mile of it, steer E.N.E. ½ E., to anchorage in 5 or 6 fathoms, muddy bottom.

To enter Inner Harbor bring Ten Pound Island light to bear N.E., and steer N.E. ½ N., leaving Round Rock Shoal, Ten Pound Island Ledge, on the starboard hand. When the light bears E.S.E., distant 300 yards, steer N.E. by E. ¾ E. into Inner Harbor.

Eastern Point light is a fixed light, 60 feet above the sea, on the Eastern point of the harbor of Gloucester. A ledge extends one-quarter of a mile to the Southward and Westward of the point. *Eastern Point Light-house.*

DANGERS.—Webber's Rock, with 7 feet water on it, lies S.W. by S., one-sixth of a mile from the light. *Dangers.*

Round Rock Shoal is in line with, and half-way between Eastern Point and Muscle Point, and has 12 feet water. On it is a black spar buoy, No. 1.

Ten Pound Island Ledge is one-third of a mile S.W. ¾ W. of Ten Pound Island light, and has on it 7 feet water. On the West Edge is a red spar buoy, No. 2.

Field Rocks, or Fresh Water Cove Ledge, are half a mile West of Ten Pound Island, and one-quarter of a mile from the Western shore. They are dry at low-water, and have near them a black spar buoy, No. 3, in 15 feet water.

Babson's Ledge is 200 yards South of Fort Point, at the entrance of Inner Harbor, and has 8 feet water on it. On the S.S.E. edge is a black spar buoy, No. 5, in 15 feet water.

Pinnacle Rock lies off the large wharf, 80 yards S.W. of Spindle Rock, and has on it 9 feet water. Black spar buoy, No. 7, is placed close to this rock.

Harbor Rock and others, not mentioned above, are marked by iron beacons.

Bound for Gloucester Harbor, and falling in to the Westward, as far as Half-way Rock, on which there is a square granite beacon, painted black, 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, which bear from the lights on Baker's Island S.E. ½ S. to S.E. ½ E., about 2¼ miles distant. On the S.E. part of these breakers is placed a black spar buoy, bearing from Half-way Rock N.E. by E., about one mile distant. When to the Eastward of these breakers, you may bring the light on Ten Pound Island to bear N.E., and run for it. On this course you will leave Ten Pound Island Ledge on your starboard hand, and the ledges of Norman's Woe Rock and Fresh Water Cove on your port hand. When up with Ten Pound Island, steer as above directed.

Baker's Island lights bear from Eastern Point light W. by S. ½ S., distant 6 miles; South point of Kettle Island, W. ½ S., distant 3 miles; Half-way Rock, S.W. by W., 6 miles; light-house on Ten Pound Island, N. ¾ E., distant 1½ mile; the red spar buoy on the East end of Dog Bar, W.N.W., one-sixth of 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 6 fathoms, low-tide, muddy bottom, the light-house bearing about S.E. by E., distant about one mile or a mile and a half.

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.

DAVIS LEDGE, GLOUCESTER.—The iron buoy on this ledge has been removed, and a second-class nun buoy substituted. It ispainted black, with the words "Davis Ledge," in white letters, on three sides. *Davis Ledge.*

About 30 fathoms off from Norman's 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-tide.

Half-way Rock, and the rock on Ten Pound Island, bear W.S.W. ½ W. and E.N.E. ½ E. of each other, distant about 8 or 9 miles.

Half-way Rock. HALF-WAY ROCK.—This is a high rock of about 30 fathoms diameter, lying S. ¼ E., 2 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. SATAN'S, OR BLACK ROCK, is above water, steep to, and bears S.W. by S. from Baker's Island, distant 1¾ mile, and from Half-way Rock N.W. by W. ¼ W., a mile and one-sixth. On it is a red spar buoy, No. 10.

Salem Harbor. 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 2 miles distant, steer W.S.W. about 3 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. Variation in 1850, 10° 15′ W.

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. Light-houses. 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, one of which is 64 feet, and the other 87 feet above the sea. They are both fixed, 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. 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, on which is a red spar buoy, 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 474 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 light 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 1½ mile from Salem Rock. On it is a black spar buoy.

Hardy's Rocks (on which a red beacon is erected) bear W. ¾ N. from Baker's Island lights, distant five-eights of a mile. They are covered at high-water, and are dangerous. At half-tide they are visible. Rising States Ledge bears W. ¾ N. from them, 150 fathoms distant.

Bowditch's Ledge, on the East end of which is a triangular monument of granite, with a black top, 32 feet high, placed in 2½ fathoms, bears from Baker's Island light-house W.N.W., 1¼ mile distant, and is seen at low spring-tides. Off the East side, in 15 feet water, is a black spar buoy.

Cat Island is situated about S.W. by W. from Baker's Island, 2 miles distant, and about 1¼ mile to 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 this 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.

Spar Buoy. 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 1¼ 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 is a spar buoy, painted black. It comes out of water at half ebb. *Spar buoy.*

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. ¼ S., 2 miles distant; and from Baker's Island light W. ¼ S., 2½ 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. On it is a granite beacon, with black and white horizontal stripes.

Gray's Rock bears N.W. from Cat Island, distant three-quarters of a mile; W. by S. ½ S. from the light-house, distant 2⅓ 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. ½ S. on account of Gale's Ledge, on which there is a red spar buoy, which bears from the lights N.E. by E. ⅛ E., 1⅓ mile distant, having but 4 feet water at low-tide.

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. until you have passed Bowditch's Ledge, or until 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 port 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, on which there is a square granite monument with black top, 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 7 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. On Little Aqua Vitæ is a red spar buoy with two prongs; on Great Aqua Vitæ is a granite beacon with black top.

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. ½ W., or N.N.W., leaving the Brimbles and Eagle Island to the starboard, and Coney Island Ledge, on which there is a black spar buoy, to port—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 Satin or Black Rock, leaving it on the port hand, and the Brimbles and Eagle Island on the starboard; continue this course, and you will leave the Haste on the port 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 will reach Beverly Bar, which is a spot of sand running out from the Southern or Salem side of the entrance, and has a black spar buoy upon it. 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, on which is a square granite beacon with a fish-shaped vane on top, painted black, and which bear from the head of the bar W. a little S., and not half a mile distant. They are above water at half-tide. To avoid this point, *Beverly and Manchester.*

after having well cleared the bar, you will steer towards Ramhorn Rock, which has a square granite beacon, with red sugar-loaf shaped top, 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 Ramhorn Rock. Giving this a good berth, you then clear the sandy point, and steer for the Lobster Rock beacon, bearing from Ramhorn 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 light S. ¼ E., 2 miles distant. Hardy's Rocks bear from the lights W. ¾ N., distant five-eighths of a mile. On them is a black spar buoy.

Marblehead light. MARBLEHEAD.—On the South side of the entrance to Marblehead Bar is a fixed light 43 feet above the sea. 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 2¼ miles. Variation, in 1850, 10° 15′ W.

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. ¾ E., distant 1½ mile. Drawing near to the lights, take care of a ledge, called the Whale's Back, on the East end of which is a red spar buoy No. 6, and on the West is a red spar buoy No. 8, 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 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, on which is a black spar buoy,) the Brimbles, and North point of Cat Island, on the port 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 port 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 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.	"		do.
Gray's Rock	N.E. by E. ½ E.	"	1	do.
Peach's Point	N. by W. ½ W.	"	1	do.
Fort Head	N.	"	½	do.

Vessels coming from the Eastward, and running for Half-way Rock, (described in page 248,) 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 port 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, on which is a red spar buoy in 9 feet water, and a black iron spindle on the dry rock, bear East and West of each other, distant about one mile.

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 a 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-tide, and bear N.E. by E. ⅛ E. from the lights, distant 1¾ 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. ¼ W. and S.E. ¾ E., 40 feet distant.			
Eastern point of Cape Ann bears	E. by N. ½ N.	7½	miles distant.
Gale's Ledge, which has a spar buoy on the S.W. end, and on which are 3 feet water, low-tide	N.E. by E. ⅛ E.	1¾	do.
House Island, at the mouth of Manchester Harbor	N.N.E.	1	do.
Saule's Ledge, in Manchester, (black spar buoy)	N. ½ W.	¾	do.
East Part of Whale's Back	N. by E.	¾	do.
Pilgrim's Ledge, (13 feet, low common tides,) on which is a red spar buoy	N.E.	1½	do.
Great Misery	N. by W. ¼ W.	1	do.
Misery Ledge, (has 8 feet at low-tide)	N.W. by W. ½ W.	1¼	do.
South part of Little Misery	N.W. ½ N.	¾	do.
Whale's Back, (comes out at two-thirds ebb)	N. by E. ½ E.	¾	do.
Bowditch's Ledge	W.N.W.	1¼	do.
North part of Hardy's Rocks	W. 1½ N.	¾	do.
North part of Haste Rock	W. ½ N.	2½	do.
South part of Coney Island	W. ¼ S.	2¼	do.
Nagus Head, or Marblehead shore	W. ½ S.		
Gray's Rock	W. by S. ½ S.	2⅛	do.
North part of Eagle Island	W. by S. ½ S.	1½	do.
South part of Marblehead Neck	S.W. by W. ¼ W.		
North part of Cat Island	S.W. by W.	2	do.
Middle of Pope's Head	S.W. by W.	⅔	do.
North part of Western Gooseberry	S.W. ½ S.	⅞	do.
South Gooseberry	S.S.W. ½ W.	½	do.
Satan, or Black Rock	S.W. by S.	1¾	do.
Eastern Gooseberry	S.S.W ½ W.	¾	do.
Half-way Rock	S. ¼ E.	2	do.
South Breakers of Baker's Island	S.E. by S.	2¼	do.
Archer's Rock, on which is a red spar buoy, (has 7 feet at low-tide)	S.W. by W. ½ W.	2⅓	do.

Outer breakers, known generally by the name of Outer Middle, (on which is a black spar buoy,) and Inner Breakers; this is a very extensive and dangerous shoal, extending from Searle'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. ½ S. to S.S.E. ½ E. 2¼ 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.

Searle's Rocks, on which is a black spar buoy: 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. point of Baker's Island, S.E., distant a small one-fourth of a mile. There is a good channel between the island and Searle's Rocks, by keeping the island best on board, say at a distance of 30 or 40 fathoms. In this channel are 3 to 5 fathoms water, at low common tides.

Egg Rock off Nahant. Light. EGG ROCK OFF NAHANT.—The light, which is fixed, is on the keeper's dwelling, 87 feet above the sea, which bears N.N.E. from Nahant Head, and should be seen about 10 miles.

The following bearings are given from this station:

Graves Bell-boat	S.E. by S.
Nahant (East Point)	S. ½ E.
Methodist Church (Swampscott)	N.N.W. ½ W.
Half-tide rock beacon	N. ¼ W.
Outer dry Pig Rock	N.E. ¼ N.

Boston Light-house. BOSTON LIGHT-HOUSE is situated on the Little Brewster Island, on the North side of the entrance to the harbor. The light is revolving, and is 87½ feet above the level of the sea.

Narrows Light. There is a fixed red light, 35 feet above the sea, on the West end of the spit which makes out from the Great Brewster Island. It is an iron screw pile tower of a dark color, and is intended as a guide through the Narrows. This light, in range with Long Island Head light, leads clear of Harding's Ledge. The following bearings are given from the light:

False Spit buoy	E.S.E. ¼ E.
Point Alderton buoy	E.S.E. ¼ E.
North Centurion buoy	S.E. ¾ S.
Long Island Head Light	W.N.W. ¼ W.
Nix's Mate beacon	N.W. ½ W.

Long Island Light. LONG ISLAND LIGHT, on the N.E. point of Long Island, is a fixed light, 80 feet above the sea, bearing from Boston light W. ¼ N.

Stellwagen's Bank. STELLWAGEN'S BANK.—The least water on the bank is 10½ fathoms at six and a half nautical miles N. 30½° W. (true) from Race Point light, Cape Cod. It lies generally outside of a line from Race Point light to Thatcher's Island light. Cape Ann. Is 17 nautical miles in length, 5 miles at its greatest breadth, 2½ at its least, and 3 miles in average breadth.

Its direction by compass is nearly N. by W. and S. by E. The North end of the bank is in the latitude of Nahant nearly, and the South end in that of a point 5 miles South of Scituate light, so that it lies in the direct approach from the Southward to Boston, and, being at a convenient depth for sounding while crossing it, is perfectly safe. It will serve as an excellent mark in foggy or stormy weather to determine a vessel's position. From 10½ fathoms at 6½ nautical miles from Cape Race light, the bank deepens on the average but very slowly, reaching 13 fathoms at 9 and 11 miles, 14 fathoms at 13½ and 14 miles, and 14½ fathoms at 20 miles. It then deepens more rapidly to 20 fathoms, and then quite rapidly from this to 30 and 35 fathoms. The outer side of the bank slopes off gradually, and the inner quite abruptly, as a general rule.

By it you can ascertain your distance to the Eastward of the coast, and, by attention to the lead after passing inside, a good idea of the latitude may also be obtained—thus, 3 or 4 miles to Westward of the Northern half of the shoal the water deepens generally to 50 fathoms, while at the same distance inside of the Southern half the greatest depth of soundings diminishes gradually from 45 fathoms, in lat. 42° 15′ N., to 35 fathoms, all the way across to the main-land.

The following buoys have been placed on this bank:

A first-class can buoy, painted red, in about 11 fathoms water, N.N.W., 6 miles from Race Point light-house, and S.E. by E. ¼ E., 28 miles from Boston light-house.

A second-class nun buoy, painted with white and black perpendicular stripes, in about 15 fathoms water, E. by S. ¼ S., 26 miles from Boston light-house.

A first-class can buoy, painted black, in about 15 fathoms water, E. ¼ N., 21¾ miles from Boston light-house.

DANGERS IN APPROACHING BOSTON HARBOR.

Graves bell-boat. The Graves are a parcel of dry rocks, which appear white, lying to the Northward and Eastward of Boston light. On the N.E. ledge is an iron bell-boat in 10 fathoms water, Long Island light bearing W.S.W. ½ W., 4¾ miles distant, and Boston light S.W. ½ S., 2¾ miles distant.

Thieves' Ledge, of 4½ fathoms, lies E. ½ S. of Boston light, distant 3 nautical miles. *Thieves' Ledge.*

Harding's Ledge, on which there is an iron bell-boat painted black, is dry at low-water. From the bell-boat Boston light bears N.W., 2½ miles distant, and Long Island light N.W. by W. ½ W., 5 miles distant. *Harding's bell-boat.*

Martin's Ledge lies nearly midway between Thieves' Ledge and the Graves, and has on it 13 feet at low-water. Outside of the ledge, in 6 fathoms, there is a red nun buoy, No. 2., Graves bell-boat bearing N. ¼ E., 1½ mile, and Harding's bell-boat S. ¼ W., 2½ miles distant nearly. Long Island light W. ¼ S., 4½ miles distant. Between the Outer Brewster and Martin's ledge, on the last-mentioned range, lies Tewkesbury's Rock, with 9 feet on it at low-water. *Martin's Ledge.*

N.W. nearly from Martin's Ledge, between Green Island and the Graves, is a ledge of sunken rocks called Roaring Bull, S.W. of which is a shoal spot of 10 feet, and N.E. is a spot of 18 feet water.

Barrel Rock lies N.W. by W. from the North part of Green Island, and has 4 feet on it at low-water. Near it, in 21 feet water, is a can buoy, red and black horizontal stripes, Long Island light bearing S.W. by W. ¼ W., 2½ miles, and Deer Island Point beacon W.S.W. ¼ W., 2 miles distant. *Barrel Rock.*

West of Green Island, one-half mile distant, is a ledge of rocks called the Devil's Back, on the Northern part of which is a black buoy No. 1, in 18 feet water, Barrel Rock buoy bearing N.W. one-half mile, and Long Island light W.S.W., 2½ miles distant. *Devil's Back.*

E.N.E., one-third of a mile from Devil's Back buoy, lies Maffit's Ledge, on which are 12 feet water, and S.S.E. ¼ E. of same buoy, are Half-tide Rocks, in Hypocrite Channel, near which is a red spar buoy No. 2. *Half-tide Rocks.*

Egg Rocks or Shag Rocks lie East of the North point of Little Brewster Island. The ledge is about one-third of a mile long, and runs N.E. and S.W. nearly. N.E. of the ledge, about one-half mile distant, is a shoal spot with 18 feet water, and about midway between the Eastern points of Middle and Little Brewster Islands is another spot of the same depth. *Egg Rocks Shoals.*

Nash's Rock, with 12 feet water on it, lies on the Northern side of main ship-channel, one-third of a mile S.W. of the Western part of Little Brewster. *Nash's Rock.*

Kelly's Rock, with 15 feet water on it, lies to the Westward of Nash's Rock, about midway between it and George's Island, and is also in main ship-channel. *Kelly's Rock.*

Tower Rock lies off the S.W. extremity of Brewster Bar, in mid-channel. It has on it 17 feet water. *Tower Rock.*

Black Rock is on Brewster Bar, in Black Rock Channel, N.Eastern part.

A ledge of rocks called Ram Head makes off from the Northern part of Lovel's Island. On the Northern part of this ledge is a black can buoy No. 5, Long Island light bearing W.S.W. ½ W., 1½ mile distant. *Ram Head.*

Nix's Mate lies between Long Island and Lovel's Island, about half a mile from Long Island Light. There is on it a square granite beacon, with octagonal pyramid on top, painted black. *Nix's Mate beacon.*

A black nun buoy, No. 9, has been placed on the North end of Nix's Mate, in 15 feet water, low-tide.

Between Rainsford Island and George's Island is Hospital Shoal, on the Northern part of which is placed a black nun boy No. 1, in 18 feet, low-water, Long Island light bearing N.N.W., 1¼ mile distant nearly. *Hospital Shoal.*

Toddy Rocks lie E.S.E. ½ E. from the buoy on Hospital Shoal. Near them is placed a black nun buoy No. 3. *Toddy Rocks.*

South of Rainsford Island are the Quarantine Rocks, and South of the Rocks lies Hangman's Ledge, on which is a granite open-work beacon, with a small square cage on top. The rocks are dry at low-water. *Beacon.*

There is a rock with 12 feet water on it, bearing S. 45½° W. from Boston light, distant 700 yards. The new beacon on the spit open to the North with the hotel on Long Island leads clear to the South of it. *Rock and Beacon.*

Another rock, with 15 feet on it, bears S. 75½° W. from Boston light, 770 yards distant, and from the new beacon on the spit South and East, distant 240 yards. *Rock.*

The hotel on Long Island, shut in entirely with the North part of George's Island, leads clear to the South of it.

Another rock, with 17 feet on it, bears S. 85¾° W. from Boston light, 2343 yards distant, and from the old beacon on the spit South and West, 117 yards. *Rock*

Nix's Mate, on the Northern edge, or at the furthest the centre of Bunker Hill Monument, leads clear to the South of it.

If Bunker Hill Monument is not visible, keep Deer Island beacon on the North end of Apple Island, while passing the range of the old beacon spit on the little head of the Great Brewster.

Another rock bears E.N.E. from the Outer Brewster, distant one-quarter of a mile. There are 9 feet water on it. *Rock*

The outer Ledge, of 17 feet, bears E.N.E. from Boston light, 2 miles distant.

There is a red nun buoy, No. 10, on Seventy-four Bar, in 15 feet, low-water, about 20 fathoms West of the old wreck, which has but 9 feet on it at low-tide. The following magnetic bearings are given:

Nix's Mate beacon	W. ¾ N.
Nix's Mate buoy	N.W. by W. ¾ W.
Deer Island Point Beacon	N.W.

A black spar buoy, No. 1, has been placed off High Pine Ledge, in 15 feet water. The rock is dry at low spring-tides. The following magnetic bearings are given:

Gurnet lights	S. ¼ W.
Captain's Hill	W. ¾ S.
Brant Point	N. by W.

Boston Harbor. BOSTON HARBOR.—Coming from the vicinity of Cape Cod, keep to the Northward of the direct course, if the wind is N.E., and to the Westward if it is S.W., making allowance always for the tide. With a leading wind the direct course may be made good on the flood, but the ebb sets towards Minot's Ledge light.

Coming from the vicinity of Cape Ann, no particular precautions are necessary. Falling close in with Scituate light, without having seen the light-boat during the night or thick weather, in 10 or 12 fathoms, run North into 17 or 18 fathoms, and steer W.N.W. for Boston light. The bearings from the light-boat are:—Boston light, N.W. ¾ W.; Minot's outer rock, S. ⅝ W.; Scituate light, S.E. by S. ½ S. Vessels without a pilot should not pass to the Southward of the light-boat.

Bearings outside.—When near Scituate light, to clear Minot's ledge, bring the light to bear South, and steer North; from Minot's Ledge to Boston light, N.W. by W.; and from the light-boat, N.W. ¾ W.; but in thick weather it is most prudent to steer N.W. until up with the Hardings, and then W.N.W., allowing for wind and tide. From Hardings to Boston light, N.W. ¼ N. From Nahant Head, if bound for Main Ship-channel, steer S.S.E. to pass the Graves, which will give a berth of one-half a mile, and from the Graves S.S.W., until up with the bearing for entering the channel. Vessels may pass inside the Graves, keeping one cable's length from the S.W. point.

Beating in Boston Bay.—Working up to Boston Harbor in the day, you may stretch safely anywhere from Minot's Ledge to Nahant Head, until up with the Graves on one side, and the Hardings on the other.

The N.E. part of the Graves must not be approached nearer than one-half a mile. At the Hardings it is safe to go close to the buoy. Inside of the line from the Graves to the Hardings, you may stand to the Southward to within one-half mile of shore, and to the Northward, to within three-quarters of a mile of the East end of the Outer Brewster, or the E. end of Egg Rocks.

When up with Egg Rocks, you must go no further to the North than will bring Boston and Long Island lights in range; and in passing Point Allerton, be careful not to go inside the buoy. A stranger may beat up to the anchorage inside of the light in the day, making short tacks, and keeping two cables' length from Light-house Island, but should wait there for a commissioned pilot. Working up for Boston Harbor in the night, you will avoid the rocks off Cohasset and Harding's Ledge, by not going further to the South than to bring Boston light to bear W.N.W. When within 2 miles of the light, go no further to the North than to bring it to bear S.W. ½ W., and when near Egg Rock, you must not pass to the North of Boston and Long Island lights in range.

Main Ship-Channel. MAIN SHIP-CHANNEL.—After making Boston light, if the weather is bad, or the vessel one of heavy draught, it must be brought to bear W.N.W. to approach it; this leads South of the Thieves' Ground, and North of Harding's Ledge. A vessel of light draught may run for it when bearing anywhere from S.W. to W.N.W., until within three-quarters of a mile of the light, when it must be brought to bear W.N.W. to enter the channel. When abreast of the light-house bearing N., being in mid-channel, or half-way between the light and Point Allerton buoy, a W. ¾ N. course, made good, leads to the beacon on the False Spit; but if the tide is ebb, or you are on the North side of the channel, steer W. or W. Southerly, to avoid going on the False Spit. Leave the beacon on the spit on the starboard hand. The course by George's Island is N.W. ½ W., with Nix's Mate and the middle of Bunker Hill monument in range, until up with the Eastern end of Gallop Island. From this point the course through the Narrows is N.W. by N., keeping in mid-channel, and steering for the high land on Deer Island until up with Nix's Mate, which leave on the port hand.

Nix's Mate should be passed with Deer Island beacon on the N.E. end of Apple Island for a vessel of light draught, and off the South part of Apple Island for a vessel of heavy draught, to avoid the shoal ground about it. A W. ¼ N. course leads from

Nix's Mate into President Roads, and this course is to be followed until the new beacon on the high part of Long Island is just clear of the N.E. bank of Spectacle Island, when the course is N.W., keeping this range on, until abreast of the buoy on the S.E. part of Bird Island.

This range leads safe by the Lower Middle, Castle Island Rocks, Governor's Island Point, the Upper Middle, and in the best water over the shoal ground above the Upper Middle. When up with the buoy on Bird Island, steer N.W. by W. ½ W. towards the State House, until abreast of the buoy on Slate Ledge, and then N.W. by N. for the anchorage.

Hypocrite Channel.

HYPOCRITE CHANNEL enters between the Outer Brewster and Sunken Rocks, thence it runs between Green and Little Calf Islands, and thence to Ram Head, where it enters Broad Sound Channel, leaving the buoys on Half-tide Rocks, Devil's Back, and Alden's Ledge on the starboard hand. Intending to run this channel, when up with the Graves, bearing N., bring the South point of Green Island to bear W., and steer for it, passing midway between Green and Little Calf Islands. After passing Green Island, steer S.W. by W., keeping the South part of the Graves open to the Southward of Green Island, until Boston light is shut in with the Great Brewster, when the buoy on Half-tide Rocks will have been passed. Then haul up W. towards Long Island light, leaving the buoy on Alden's Ledge on the starboard hand. This course leads into Broad Sound Channel at Ram Head buoy, which leave on the port hand, 50 fathoms distant. Hypocrite Channel is not safe for strangers.

Black Rock Channel.

BLACK ROCK CHANNEL leads from the Main Ship-channel at the beacon on the Spit into the Hypocrite Channel, and is never used by large vessels, except to avoid ice in the Narrows. It is narrow, dangerous, and unsafe for strangers. On leaving the Main Channel, pass close to the beacon, and steer about N.E. for the outer point of Green Island, keeping George's and the West end of Pettick's well open. Both the flood and ebb tides set across this channel. There is a passage on each side of Whiting's Ledge.

Broad Sound Channels.

BROAD SOUND CHANNELS.—Vessels intending to enter by the South Channel, may come in the sound anywhere between Nahant Head and the Graves, and steering to the S. of W. until they bring Nix's Mate to bear S.W. by W. ¼ W., may run for it. The range for this channel is Nix's Mate in the Middle of the Northern and highest of the Blue Hills. The channel is short and straight; its range is perfect, and vessels of the largest draft may resort to it with safety and convenience at half or three-quarters flood, especially in going out. Vessels in going out this way will leave Ram Head, Alden's ledge, and Devil's Back buoys on the starboard hand, and Little Faun, Great Faun, and Barrel Rock buoys on the port hand, and in running out of Broad Sound will keep Egg Rock open with Nahant Head. The North Channel passes nearer Deer Island, and is separated from the South Channel by a middle-ground. The buoys are left in the same way as in the latter, except Barrel Rock buoy, which, in going out, is left on the starboard hand. The range for this channel is the North head of Long Island (on which the light stands) in line with the second bluff on the West side. It should not be attempted in bad weather, even by vessels of the lightest draft.

Back of Western Way.

BACK OR WESTERN WAY.—This channel is used in light winds on the ebb, to escape being set out into the Sound at Nix's Mate, or the East end of Lovel's Island. Leaving President Roads, steer S.S.E. to run between Spectacle and Thompson's Islands, keeping nearly in mid-channel, and passing half-way between Moon Head and the West Head of Long Island. The bottom is soft in mid-channel. When well past Long Island Head, steer S.E. until Long Island light is open to the South of the middle head; then N.E. by E. about half-way between Bass Point and Rainsford Island. When well by Rainsford Island, steer for the South part of George's Island, leaving the buoy on Rainsford Island Shoal and Wilson's Rock on the starboard hand, which will lead into Nantasket Roads.

For Nantasket Roads.

FOR NANTASKET ROADS.—To enter Nantasket Roads from outside, when Boston light bears N., three-eighths of a mile distant, steer W. ½ S. to the buoys on the Centurion: leave these on the starboard hand close to, and steer W.S.W. until Long Island light opens clear of the S.W. part of George's Island, then haul up for the light, and run in for the anchorage.

Ranges.—Long Island light, a little shut in on Point Allerton, or in the Outer Saddle, leads clear of the Hardings to the Southward of them.

Long Island light a little open to the Eastward of the Graves, leads clear to the Eastward of the N.E. ledge.

The mark to go between the Graves and the Sunken Rocks, to clear the latter, is Boston light, a little off the Middle Brewster, between that and the Outer Brewster, and when Long Island light shows to the Northward of Green Island, you are clear of the sunken rocks to the North.

Keeping any part of the Graves open to the Southward of Green Island clears the Half-tide Rocks.

To avoid the Rainsford Island Shoal, the high-water mark on the South part of Moon Head should be kept open with the high-water mark on the North part of Rainsford Island until to the Northward of the buoy.

Going the South Channel round Long Island, you should be careful not to shut Governor's Island in with Spectacle Island, in order to clear the reef between Spectacle and Long Islands.

To stretch up between Long and Spectacle Islands, go to the Eastward of the buoy and close to it. Go no further to the West than to open the East head of Long Island clear of the middle head; or in the night, to see Long Island light just over the middle head. This clears the flats E. of the reef.

After leaving the anchorage off the city, when Moon Head opens clear of Fort Independence, on Castle Island, you may run for Castle Island wharf, keeping it a little on the starboard bow.

From Castle Island wharf to President Roads the range is a high steeple in the S. part of the city on with the N. line of Fort Independence.

To clear the Lower Middle in the night, the two lights should be kept about a ship's length open until to the East of Spectacle Island.

To pass through the channel to the N. of the Lower Middle, the North end of Lovel's Island should be opened a little with the Southern head of the Great Brewster, so as to show a gap between them.

Small vessels may go very near Bird Island flats with safety, by keeping Long Island light open with the high part of Governor's Island. This answers for day and night. Vessels of large draught can only follow this range at high-water.

The new beacon on the Spit, kept open to the North with the hotel on Long Island, leads clear to the South of Nash's Rock.

Shutting in entirely the hotel on Long Island with the North part of George's Island, leads clear to the South of Kelly's Rock.

Nix's Mate on the centre of Bunker Hill Monument (but not on or beyond the Southern edge of it) leads clear to the South of Tower Rock. If Bunker Hill Monument is not visible, then Deer Island beacon kept on the North end of Apple Island, (while passing the range of the old beacon on the Spit, on the little head of the Great Brewster,) will answer the same purpose.

Anchorages. *Anchorages.*—President Roads, South of a line from Nix's Mate to Castle Island, in sticky bottom.

Nantasket Roads, Nix's Mate just on with Gallop Island, and Boston light shut well on to George's Island, give the best ship-anchorage. Heavy vessels of war anchor further South.

There is a convenient refuge for coasters in N.E. winds under Spectacle Island.

Vessels caught in bad weather near Nahant without a pilot, may anchor to the West of Nahant, in from 5 to 6 fathoms, by opening Lynn Harbor, and bringing the hotel to bear E.N.E.

Waiting for a pilot, you may anchor in main ship-channel anywhere between the light-house and Nantasket Beach.

The principal dangers in and about Boston Harbor, are the rocks and ledges near the shore, under the surface, and surrounded by deep water. Persons ignorant of the ground should not approach them without a pilot. The following are particularly to be avoided:—Davis' Ledge, near the Minot's; Martin's Ledge and Tewksbury Rock, near the Outer Brewster, and Maffit's Ledge, North of the Devil's Back, which are dangerous to vessels beating in Boston Bay and Broad Sound. The rule is: first, not to go to the Southward of the light-boat off the Minot's; second, not to approach the Outer Brewster nearer than three-quarters of a mile on the East; third, keep to the Westward of Maffit's Ledge, giving it a good berth in passing. The directions for avoiding other dangers are given under the head of Ranges.

The nun and can buoys in Boston Harbor have been renumbered, and are as follows:—

Martin's Ledge	Red	No. 2.
Boston Ledge	do.	do. 4.
Point Allerton	Black	do. 1.
*Toddy Rock	do.	do. 3.
*Hunt's Ledge	Red and black horizontal stripes.	
*False Spit	Red	No. 6.
*South Point of Centurion	do.	do. 8.
*North Point of do.	Black	do. 5.
*George's Island Shoal	do.	do. 7.

Broad Sound.

Devil's Back	Black, No. 1.
Barrel Rock	Red and black horizontal stripes.
Great Faun Bar	Red, No. 2.
Aldridge Ledge	Black, do. 3.
Little Faun Bar	Red, do. 4.
Ram Head	Black, do. 5.
*S.E. end of Lower Middle	Red, do. 6.
*State Ledge	do. do. 8.
*Castle Rock	Black, do. 7.
*N.W. end of Lower Middle	Red, do. 10.
*Governor's Island Point	do. do. 12.
*Upper Middle	Black, do. 9.
*Dorchester Flats	do. do. 11.
*Bird Island Flats, S.W. Point	Red, do. 14.
*Four Point Channel	Black, do. 13.

Buoys marked thus * will be replaced by spars during the winter.

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 W.
North point of Deer Island	S.W.

Outward bound from Boston light-house, to make 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, steer S.S.E., which will carry you out of the South channel. *Light-house.*

In Boston Bay, and bound for Cape Cod Harbor, run for Race Point light-house, which contains a revolving light, until within half a mile; and 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., 11 leagues. *Light-house.* *Light-house.*

Between Cape Ann and Cape Cod you will have from 50 to 17 fathoms, the latter 4½ miles N. by E. from the Race light, with 35 fathoms inside. S.E. by E. ¼ E. from Boston light to the Race light, there is a ridge of rocks and sand of from 7 to 23 fathoms water, with a small gully of 37 fathoms, 20 miles from Boston light. To the North of this ridge the bottom is generally muddy, and the depth from 40 to 50 fathoms.

At full and change, it is high-water off Race Point at 10 hours 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. *High-water.*

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.

BOSTON LIGHT-HOUSE TO CAPE ELIZABETH LIGHTS.—From Boston light-house to Thatcher's Island lights, which lies 2 miles East from Cape Ann, the course is N.E. ½ N., and the distance 8 leagues; but to clear the Londoner, which you leave on your port 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 7½ miles from the Eastern point of Cape Ann, before described. *Boston Light-house to Cape Elizabeth Lights.*

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 N.E. 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 light, the course is N. ¾ E., distant 5⅔ leagues.

Cohasset Rocks, or Minot's Ledge. COHASSET ROCKS, or MINOT'S LEDGE, is 8 miles S.E. ½ E. from Boston light, and 6 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.

Light-ship. On Minot's Ledge there is a light-ship, which bears S.E. ¾ E., 9 miles distant from Boston light. It has 2 fixed lights, 45 feet above the sea. There is a light-house building on the outer Minot's Ledge.

There is a passage within Cohasset Rocks, used by coasters.

There is a dangerous ledge near Minot's Ledge, with 10 water on it at low-water. From it the light-boat bears N.W. by W. ¾ W.; Scituate light, S. by E.; Outer Minot's Rock, W. by N. ¾ N. To avoid it do not pass to the Southward of the light-boat.

Scituate light. SCITUATE.—The light-house is on Cedar Point, North side of the entrance, and 5 miles South of Cohasset Rocks. It is a fixed light, 49 feet above the level of the sea.

From the Northerly part of Cedar Point, 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 point, may bring the point 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 point 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 point running S.S.E. will clear Brandt's Point, consequently, giving the point half a mile berth, there will be no danger in running S.S.E.

There is a meeting-house about 2 miles W. by N. from the point; 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 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.

Sunken rock. There is a sunken rock with 6 or 7 feet water off Webster's flag-staff, lying three-quarters of a mile outside of a rock, on which a buoy is placed.

This buoy is likely to lead vessels upon the outer rock.

Brandt Point. Buoy. BRANDT POINT.—There is a ledge off Brandt Point with 8 feet water on it; Gurnet light bearing S. ¼ E., 4¼ miles distant; Brandt Point, 1¼ mile distant. There is a buoy on Philip's Ledge, three-quarters of a mile inshore of it, bearing W.N.W. ¼ W.

Gurnet lights. GURNET LIGHTS.—On Gurnet Point, the Northern side of the entrance to Plymouth Harbor, there are two light-houses, 93 feet above the level of the sea, 81 feet apart, containing fixed lights, which 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. PLYMOUTH HARBOR.*—The high land of Manomet bears from the lights S. ¼ W., 5½ miles; Manomet Point, S.S.E., 6 miles; and Brandt's Point, N. ½ W., about 6 miles; Saquash Head, W. ½ S., 3 miles; the Easternmost part of Brown's Islands, or Shoal, 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 alongside at the same time. A red 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. There are three rocks partly bare at low-water off Manomet Point. There is also a detached and very dangerous rock lying off Indian Hill, about 4 miles to the Southward

Rock.

Rock.

* 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 3 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.—Magnetic variation in 1830 9° 45′ W.

of Manomet Point. It has but 6 feet water on it. 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. ¼ 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. There is a rock near Saquash Head which *Rock* is dangerous to vessels beating into the harbor. It is quite sharp, and not easy to detect. If you are bound into the Cowyard, 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 the 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.

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 3 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 1¼ mile from 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 Cowyards, you must steer as before directed. If in the night, it is best to anchor here, as it is difficult to make Beach Point (being mostly covered at high-water) if dark, or go into the Cowyard.

Cowyard beacon is a square granite structure, surmounted by a granite post, 4 feet high, painted red.

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 Manomet Hill, 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 Shoal, 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 the 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 leagues 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 near 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. CAPE COD LIGHT.—A light-house, containing a fixed light, 171 feet above the sea, is erected on the Clay Pounds, highlands of Cape Cod.

Race Point Light. RACE POINT.—(Cape Cod.) On this point is a fixed light, varied by flashes, 35 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 Light. LONG POINT.—On Long Point, at the entrance of Provincetown Harbor, is a light-house containing a fixed light, elevated 28 feet above the level of the sea.

Cape Cod Harbor. 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 fair way 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.

Large ships 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 80 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 the 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 until 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 2 and 3 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 from 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 anchorage 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., 6 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 port hand, when you may haul to to Eastward, and anchor safe from all winds.

Light. BILLINGSGATE ISLAND LIGHT-HOUSE is on Billingsgate Island, at the entrance of Wellfleet Bay, 5 leagues S.E. by S. from Race Point light. It is a fixed light, 40 feet above the sea, 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 a 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. As 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 windmill 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 Manomet W. by N. ¾ N., distance about 8 leagues; entrance of Barnstable, the Black Land, called by some Scargo Hill, in Dennis, S.W., distant 16 miles, S.W. by 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., 4 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 to two feet water at low-tide, and around this rock are 9 to 11 feet water at low-tide, bearing from the light-house E. by S. ½ S., distant 1¼ mile. When on this rock, Chipman's windmill, 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. ¼ E.: this rock is covered at high-water; and a windmill 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 18 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.

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 the shore to the entrance of Sandwich are 3 fathoms, and distant 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 one and a half or two miles are 9 to 10 fathoms, muddy bottom.

Passing from Sandwich towards Barnstable, the flats run off shore 100 to 180 fathoms.

TIDES.—The neap tides rise 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.

Light.

BARNSTABLE LIGHT is a fixed light erected on a dwelling-house. It is 33 feet above the sea.

Barnstable Harbor.

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 red spar 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. ¼ 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 a cable's length of the beach, and follow the shore roundthe 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.

Statement of the locations of Life-boats, Mortar Stations, and Huts of Refuge on the Coast of Massachusetts, under the care of the "Massachusetts Humane Society."

DIAMOND STAGE, Ipswich River, 1½ mile from the entrance or bar, one boat under the care of A. V. Pilsbury.

IPSWICH LIGHT, near the Long Beach, one small boat and carriage, under the care of Thomas S. Greenwood, keeper of the light.

ANNIS SQUAM, Cape Ann, at the light, under the care of Dominicus Poole, keeper of the light, one boat.

ROCKPORT, Cape Ann, near the centre of the village, one boat, under the care of Mr. Bradley.

GLOUCESTER HARBOR, near the centre of the town, one boat, under the care of Mr. Geo. H. Rogers.

MARBLEHEAD, inside the harbor, two boats, under the care of Mr. Goodwin.

MANCHESTER, one large metallic life-boat, built by Francis, and placed under the charge of the Society by the Treasury Department, under the charge of Capt. Tyler Parsons.

SWAMPSCOTT, near Phillips' Beach, one boat and carriage, under the care of the selectmen of the town.

NAHANT, on the N.E. side, near the hotel, one boat, in charge of the selectmen, and handy to launch on either side of the peninsula.

DEER ISLAND, Boston harbor, one small boat, under the general care of Dr. Moriarty.

POINT ALLERTON, inside of the buoy and rocks, on the N.E. part of the point, one boat, under the care of Mr. M. B. Tower.

HULL BEACH, on the inside of the neck connecting Hull with Nantasket, one boat; also a life-car, mortar, hawser, and other means of communicating with a wreck, under the care of Mr. Tower.

NANTASKET BEACH, about 2 miles from Point Allerton buoy, one new boat, also under the care of Mr. Tower.

PLEASANT BEACH, situated a mile or so from the entrance of Cohasset Harbor, to the westward, one boat, under the care of Capt. Isaiah Baker.

COHASSET HARBOR, two boats, near Homing Point, inside the western entrance of the harbor, under the care of Alfred Whittington, and superintended by Capt. Dan. T. Lathrop.

NORTH SCITUATE BEACH, inside of Minot's Ledge and Rocks, one boat, in care of Thomas Damon.

BASS COVE, about one mile Easterly from Scituate town, two boats in one house, under the general care of Capt. Ezekiel Jones, formerly of the Revenue Service.

SCITUATE HARBOR, near the light, one large metallic life-boat, placed under the care of the Society by the Secretary of the Treasury, and in keeping of the light-house keeper, Mr. Alonzo Jones, and superintended by Capt. Jones.

WHITE'S FERRY, near the line dividing Scituate from East Marshfield, one boat and carriage, under the care of Mr. William Harrington, wreck-master.

MARSHFIELD, inside of Cut River, one large boat, under the care of Capt. Weston, near the Webster Farm.

DUXBURY BEACH, at Powder Point, near the village, one small boat, under the general care of Capt. Frazer, wreck-master.

PLYMOUTH HARBOR, western part, one boat, under the care of the selectmen of the town; and about 1½ mile to the S.E. of her, on Long Beach, one boat, also under the care of the selectmen.

MANOMET POINT, South of Plymouth Bay, one new boat.

RACE POINT LIGHT, one boat, under the care of Mr. Crocker, keeper of the light, who has also a chest of seamen's clothing, belonging to the Society, for occasional relief.

SOUTH-EAST OF THE LAST, about 1½ mile, is a boat, also under the care of Mr. Crocker.

SOUTH-EAST OF THIS, about 1½ mile, is a boat, back of the beach, under care of Mr. Atkins.

PEAKED HILL BAR STATION.—At this point there is a mortar-station, life-car, hawser, and other means of communicating with a wreck; also a house of refuge, with fuel, straw, &c.; and, on each side of the station, on the beach, are posts with hands pointing towards the station: these posts are continued for a considerable distance each way, and are for the purpose of guiding the shipwrecked seaman to a place

of shelter. Watch is kept here during stormy weather. Capt. Atkins, who occupies the first house in Provincetown, in the direction of the station, has charge of the station, and has a supply of clothing belonging to the Society. There is also a surf-boat lately put there.

HIGHLAND LIGHT.—About one mile north of the light, back of the beach, is an old boat, under the care of Mr. Small, keeper of the light.

NEWCOMB'S HOLLOW.—About 5 miles South of the Highland light is a surf-boat, under the care of Capt. Mulford Rich, who has a good surf-boat of his own, at the same station. All the boats, &c., from this point to Race Point, are under the general superintendence of E. S. Smith, Esq., of Provincetown.

CAHOON'S HOLLOW.—About two miles South of the last station is a hut of refuge and a small surf-boat, under the care of Capt. Henry Baker, who resides about 2 miles from the station.

NAUSETT BEACH.—About one mile south of the three lights is a surf-boat, under the care of Capt. Michael Collins, keeper of the lights.

NAUSETT HARBOR, North of the entrance a short distance, is a government metallic boat, mortar-station, life-car, hawser, house of refuge, &c., under the superintendence of Capt. J. S. Doane, as chairman of the committee, who lives near by at East Orleans.

ORLEANS BEACH, South of the harbor of Nausett, one new surf-boat, also under the care of the same parties.

NORTH CHATHAM, in the harbor near the new opening, one boat, under the care of Capt. Brazili Stetson.

CHATHAM, a short distance North of the lights, on the main-land, is a surf-boat, under the general care of Capt. J. Hardy, Jr.

CHATHAM BEACH, opposite the town, is a government metallic boat, a life-car and mortar-station, hawser, &c., with a hut of refuge, in which the apparatus is kept; and another hut further South, all under the care of Capt. Hardy.

MONOMOY POINT, one metallic boat, furnished, like the two last, by government, and one surf-boat—the latter is near the light, and both are under the care of Asa Nye, keeper of the light.

NANTUCKET EAST END, at Kros Katy Farm, one surf-boat, in a hut of refuge, and one dory, under the immediate care of Thomas Dra, who lives at Folger's Farm, near by.

GREAT POINT, inside, near the light, one surf-boat, in charge of the light-house keeper.

NANTUCKET WEST END.—At Smith's Point is a hut of refuge and a surf-boat, under the immediate care of D. G. Patterson.

NANTUCKET BAR, a government metallic life-boat and house, under the care of D. G. Patterson also.

TUCKANUCK, one boat, under the care of Mr. Dunham.

NANTUCKET, at the town, in charge of a committee, of which Capt. P. H. Folger is chairman, and which has charge of all the stations on the island, is a mortar, hawser, and apparatus for communicating with wrecks, which can easily be transported to any necessary point.

CHAPPEQUICLIK, West side of Tuckanuck Channel, on Martha's Vineyard, is a surf-boat, under care of Thomas Huxford, who lives one mile from the boat, inland.

SOUTH BEACH, 3 miles from Edgartown, one boat, under the immediate care of Mr. Bartlett Stewart.

GAY HEAD, on the inside, northerly from the light one mile, one boat, under the care of Samuel Flanders, keeper of the light.

CUTTIHUNK, near the light, on the north side, two boats, in charge of Corbit Chandler, keeper of the light.

Besides the huts of refuge attached to and connected with the boats, there are other huts near Marblehead light—on Nantucket Beach two, two on Scituate Beach, one at North Chatham Beach, one at Duxbury, one at Marshfield, two at South Scituate. Mariners are strongly recommended not to attempt landing from a stranded vessel until near low-water, and generally to wait patiently until succor comes from fresh and willing hands on the beach.

R. B. FORBES,
Chairman of Standing Committee, Mass. Humane Society.

BOSTON, *1st Jan.*, 1856.

CAPE COD TO NANTUCKET.

Cape Cod to Chatham.

CAPE COD TO CHATHAM.—From the Highland light to Nausett lights, the course is S. by E. 12 miles; thence to Chatham lights S. ¾ West 11½ miles; the shore is sandy.

Nausett Beach lights

NAUSETT BEACH LIGHTS.—On Nausett Beach three light-houses, one hundred and fifty feet apart, have been erected. They are all fixed, and 93 feet above the sea.

Chatham Lights.

CHATHAM LIGHTS are two fixed lights on James' Head, 70 feet above the level of the sea; they are only in use in running over the shoals, as the beach has made out 2 or 3 miles to the South since they were erected.

Chatham Harbor.

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.

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. Magnetic variation in 1850, 9° 45′ W.

NANTUCKET SOUND, NORTH SHORE.

Monomoy Point light.

MONOMOY POINT LIGHT is a fixed light, 33 feet above the level of the sea, on Monomy 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.

Pollock Rip Light-ship.

POLLOCK RIP LIGHT-SHIP, which is painted red, bears S.E. by E. ¾ E., distant 3¼ miles from Monomoy Point light. The light is 45 feet above the sea.

This Rip, on which there are but 5 feet water, extends 4 miles in an E. ¾ S. direction from Monomoy Point light. There are two channels across it, the outer one of 13 feet, which has a light-ship, and which bears S. 2° W. from Chatham light, distant 8 miles.

To cross the Rip by the outer channel, bring Chatham lights to bear N 2° E., and steer South until you make a black buoy which bears from the light-ship N. 2° E., half a mile distant, and is in 3 fathoms water, which you leave on the starboard hand, when up with the light-ship, which you can pass on either side: steer W. ¾ S., 3 miles on this course; you will pass a red buoy on the port hand on the Northern end of the Stone Horse, which bears from the light-ship W. ¾ S., distant 3 miles. You continue this course to the black buoy, No. 7, on the S.W. part of the Handkerchief, which bears from Nantucket (Sandy Point) light N. ½ E., distant 6½ miles.

To cross the Rip through the inner channel, through which you can carry 10 feet, bring Monomoy Point light to bear S.W. ½ W., and run on that course until you judge yourself 2 short miles from the light, or see a black buoy bearing S. by E. of you, which you steer for, leaving it on the starboard hand (this buoy is in 13 feet water;) keep on this S. by E. course one mile, or until you get into 5 fathoms, when you shape your course S.W. by W. ¾ W., 6½ miles, for the black buoy on the Handkerchief.

This channel will only do in the day-time.

When one quarter of a mile East of Bearses Shoal, a N.E. course will carry 9 feet over the Rip at low-water. This channel is half a mile wide, with much shoaler water on either side.

To cross between Shovelful and Bearses Shoal, on the East end of which is a black spar buoy, follow the beach until Monomoy light bears N.N.W. ½ W., then steer S.S. E. ½ E., until it deepens, when you will be in Butler's Hole—then steer as above directed.

Bound through the Vineyard from the Northward, to go through Pollock Rip.

When East of Chatham lights about 2 miles, bring Pollock light-ship to bear S. by W. ½ W. and run for it, leaving the black buoy, No. 1, on the starboard hand. After you have passed the buoy on that course a quarter of a mile, steer W. by S. ½ S., 6¾ miles, to the black buoy, No. 7, on the South point of the Handkerchief; then W. by S. 9¼ miles to the black buoy, No. 5, on the South-east point of the Horse-shoe; then W. ½ N. 2¼ miles to the Cross Rip light-ship.

Stone Horse.

STONE HORSE.—This shoal, on the North point of which there is a red buoy, in 10 to 12 feet water, which bears from Monomoy Point light S. 1° W., distant 1½ mile, is of a circular shape, the concave part being on the Eastern side, and has a S.S.E. and N.N.W. direction, with 4 feet on it in places.

Its length from the red buoy to the black buoy of the Little Round Shoal is 3½ miles; the buoys bear from each other S.E. 1° E. and N.W. 1° W. Its width is about 1¼ mile.

Little Round Shoal.

LITTLE ROUND SHOAL.—This shoal, on which there are but 2 feet water, and which may be considered the S.E. point of the Stone Horse, bears from Chatham lights S. 7° W., distant 10½ miles. There is a black spar buoy on it, in 8 feet water, which bears from Monomoy Point light S.S.E. 4° E., 4¾ miles. From Nantucket Point light, N.E. ½ E., distant 8 miles. About E.N.E., 3 miles distant from the buoy on Little Round Shoal, is a spot of 13 feet, Pollock Rip light-vessel bearing N. W. by W., 2¾ miles distant.

GREAT ROUND SHOAL, is partly dry at low-water. On it there is a black nun buoy which bears from Monomoy light S.S.E. 4° E., 8½ miles. From Nantucket Point light N.E. ¾ E., distant 8 miles. *Great Round Shoal.*

About 1¾ mile East of the buoy on the South point of Great Round Shoal is a shoal spot of 12 feet water, Pollock Rip light-vessel bearing N.N.W.; Great Point light, W. by S. ½ S.

The channel between the Great and Little Round Shoals should not be attempted by vessels drawing over 9 feet, and then only from necessity.

The black buoy off the Little Round Shoal bears from the red buoy of the Great Round Shoal N.N.W. 4° W., distant 2 miles.

These may be considered the shoals to the Northward and Eastward of Nantucket. Those after described are the Vineyard Shoals.

HANDKERCHIEF.—This is, in fact, two shoals. The black buoy on the South point of the Western shoal, bears from Monomoy light S.S.W. ¾ W., distant 4½ miles. From Nantucket Point light N. ½ E., 7 miles distant. From here, the shoal with a width of two-thirds of a mile, partly dry, runs N. 8° E., 3½ miles, where there is a red buoy, bearing from Monomoy Point W. by N., distant 3½ miles. *Handkerchief.*

Between the Eastern side of the Handkerchief and Monomoy light there is a channel of 20 feet.

To run through this channel, after you have passed the red buoy on the Stone Horse, steer N.W. by W. ½ W. for the light-ship on the S.W. point of Shovelfull, which is in 8 fathoms water, which you leave on your port hand, and which bears from Monomoy light S.W. ¼ W., distant 1¾ miles. After you have passed the light-ship, steer N. ½ W. for the red triangle buoy on the S.E. part of the Inner Handkerchief, which you leave on the port hand. After passing this buoy steer N.W. by W. 1¾ miles, when Monomoy light will bear E. by S. ½ S., and you will be up with the red buoy on the N.W. part of the Handkerchief. *Buoy.*

From the black buoy of the Handkerchief to the light-ship on Cross Rip the course is W. ¾ S., distance 10½ miles.

Crosing the Handkerchief in 3 or 4 fathoms water, you will run W. ¾ S. for the black buoy on the Horse-shoe, 8½ miles, leaving it on the starboard hand, when you will continue your course for Holmes' Hole light, W. by N. ½ N., 16 miles distant. As you enter the Swash in the Horse-shoe, Hyannis light will bear N.N.E., Cape Poge light W.S.W., Holmes' Hole light W. Part of the Handkerchief dry at low-water.

CROSS RIP LIGHT-SHIP is on the North Point of the Rip, in 7 fathoms water. The light is 39 feet above the sea. 200 fathoms South of the light there are 11 feet water. From the light-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. ½ S.; Nantucket Brandt Point light S.E. by S.: Nantucket beacon light S.S.E.; Cape Poge light W.; centre of Tuckanuck Island S.W. ¾ S., distant 9½ miles. *Cross Rip light-ship.*

From the Cross Rip light-ship to go South of the Hedge Fence.

W. by N. ¾ N., 9⅝ miles, will bring you between the buoys of the Hedge Fence and Squash Meadow Shoals; then N.W. by W. ½ W., 7½ miles, makes Nobska Point light bear N.W. by W. ½ W., three-quarters of a mile distant: the course through the Vineyard is then S.W. by W. ¾ W., 15 miles. To go North of the Hedge Fence, from the light-ship, N.W. by W. ½ W., 15½ miles, makes Nobska Point W. ¼ S., 1¾ mile distant: the course through the Vineyard then is S.W. by W. ¾ W., 16½ miles.

Bound East, to go between Great Point and the Great Round Shoal.

When up with Cross Rip light-vessel, steer E. by S., 14½ miles, which carries you to the buoy on the N.E. point of the Great Rip; 10 more on the same course puts you to the Eastward of McBlair's Shoals.

Running 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 the L'Hommedieu Shoal, get the point on which the windmill stands, which is East of Wood's Hole, to bear W. by N., and run for it until 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 port 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. *Horse-s*

Distances from the Cross Rip Light-boat.

Nantucket Great Point Light	12½ miles.
N. end Tuckanuck Shoal	3 do
Tuckanuck Island	9 do
Cape Poge Light	7½ do
East Chop Holmes' Hole	12½ do
Point Gammon Light	9½ do
Main body of Horse-shoe	1¼ do

Shovelful Shoal. SHOVELFUL SHOAL.—A light-boat is moored on the S.W. end of Shovelful Shoal, (near Monomoy Point,) and shows a white light, 40 feet above the sea. The bearings from the boat by compass are as follows:

Bearin s.

Light Vessel on Pollock Rip bears	E. ½ S.
Buoy on Stone Horse bears	E.
Buoy on Shovelful Shoal bears	E. ½ N.
Monomoy Point light bears	N.E. 1¾ mile.
Red buoy on the N.W. part of the Handkerchief bears	N. by W.
Black buoy on S. point of the Handkerchief bears	S.W. ¾ W.

On the South point of this shoal there is a black buoy, which bears from Monomoy light S.W. ¼ S., distant 1½ mile, in 5 feet water.

The shoal extends about a quarter of a mile South of and around the light-ship, forming a crescent or bight, the Western extremity of which bears from the light-ship S. by E., a quarter of a mile distant, and has on it 18 feet. Midway between the end of the shoal and the black buoy there are but 14 feet, with a slue of 19 feet close to the buoy.

There is a passage for vessels of 8 feet at high-water between Monomoy Point and Shovelful Shoal, by bringing Monomoy light to bear S.W. by W. ¼ W., and running until 150 fathoms from the outer beach; keep that distance, sailing parallel to the beach, until you cross the Rip; on this course you pass a black buoy on your port hand. From the black buoy you steer N.W. ½ W. one mile, or until Monomoy light bears East, when you are in the fair way for such port as you wish to make.

Tides. TIDES.—The flood-tide sets North about 3 hours, then E.S.E., when the ebb commences at South, and continues till low-water. At Sankaty Head the flood sets S. E., and the ebb S.W. In the middle (or E.N.E. channel) the flood sets N.E. by S. and ebb S.W. by W.

In Butler's Hole the ebb sets West, and the 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.

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.

Powder Hole Anchorage. POWDER HOLE ANCHORAGE.—From Pollock Rip light-ship steer W. ½ N. until up with the Shovelful light-ship, then N. by W. ½ W., and steer for it until past Monomoy Point, to which give a berth of 50 yards. Anchor close inside the point in 2½ fathoms, to avoid the flats to the Eastward. A safe anchorage in all winds except from Northward and Westward.

To enter North channel, Nantucket Sound, proceed by directions for entering Powder Hole, till Monomoy light bears East, when a N.W. by W. course will clear the Northern end of the Handkerchief.

Old Stage Harbor. OLD STAGE HARBOR.—When Monomoy light bears S.E. ½ E. you steer N. by E., leaving a black buoy on your starboard hand; after you have passed the Northern one, or run 5½ miles, which will bring Chatham lights to bear E. by N., you can run in on that course and anchor in 5 fathoms.

Hyannis Point Gammon light. HYANNIS LIGHT is 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.

The harbor light of Hyannis is on the main-land inside the breakwater, and is a fixed light, 36 feet above the sea. It bears from Point Gammon light N. 22° 30′ W., 2¼ miles distant.

East from Hyannis lies Bass River, near which are the towns of Dennis and Yarmouth. A black spar buoy is placed on Dog-fish bar.

Hyannis Harbor. HYANNIS HARBOR.—Vessels coming from the Eastward, bound through the North Channel, must leave the Bishop and Clerks on the port hand, and not go nearer them than 4 fathoms. They are a dangerous ledge of rocks, bearing S. by E. from the light-house, 2¼ miles distant, and are always dry. Between these and the Middle Ground there is a light-ship, painted straw-color, Point Gammon light bearing N. by E.; East end of Hyannis Harbor breastwork, N. ¾ W.

Light.

A light is being built on the Bishop and Clerks. When finished, the light-ship will be removed to the North end of the Handkerchief.

When coming from the Eastward, bring Point Gammon light to bear N.N.W. ¼ W. in 4¼ fathoms water, and steer N.W. by W.; on which course you will have from 3½ fathoms to a quarter less 3. When the Harbor light bears N. 1° W., run for it; which course will carry you two cables' length from the East end of the breakwater. Give it a good berth towards the shore, and round to in 2½ or 3 fathoms water. Variation in 1850, 9° 15′ W.

When coming from the Westward, bring Point Gammon light to bear E. by N., or E. by N. ½ N., run for it until the Harbor light bears N. 1° W., and steer as above.

Vessels bound to the Westward from Hyannis, must run to the Southward until the light bears E. by N.; then steer W. by S., which course will carry them clear of the South-west 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., 4½ miles distant from the light, is a dangerous ledge, called Collier's Ledge, 3 miles from the shore, on which is a granite beacon, with a ball and vane on top, bearing from the light-house W. 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 further 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 24 feet water, bearing from Great Point light N. W. by W. 9¾ miles, and from Tuckanuck Island N. by E. ½ E. 9¾ leagues. Tide rises about five 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.

CHATHAM TO HOLMES' HOLE, South of the Great Round Shoal.—Outside of the Rip, bring Chatham lights to bear N.N.W., then steer S.S.E., until Monomoy Point light bears N.W. by W. ½ W., 7 miles; thence, S. by W. 5½ miles, will make Great Point light bear W. ½ S., 9¼ miles. A W. by N. ¼ N. course, 20 miles, will carry you up with the Cross Rip light-ship. From the light-ship to Holmes' Hole the course is W. by N. ¾ N., 13¼ miles, when follow the directions on page 269, for entering the harbor. *Chatham to Holmes' Hole*

Bound Eastward through the Vineyard—To go North of L'Hommedieu Shoal.

Nobska Point light bearing W. by S., 2¼ miles distant, steer E. ½ S. 8¾ miles, leaving Succonasset light-ship on the port hand, which brings you up with the Red Buoy No. 6, of Eldridge's Shoal, leaving it on the starboard hand, then E. by N. ¾ N., 6½ miles, bring you in the fairway for Hyannis.

If you mean to pass to the South of the Bishop and Clerks, after you have passed Eldridge's Shoal Buoy, steer E. by N. ¾ N., 2¼ miles, (leaving the Red Buoy No. 8 on the North point of the Horse-shoe on the starboard hand,) thence E. ½ S. 14¼ miles (leaving the Black Spar Buoy No. 5 on the South point of the Bishop and Clerks on the port hand,) will bring you up with the Red Buoy No. 2, on the North point of the Handkerchief.

To go North of Hedge Fence Shoal.

Nobska Point light bearing W. ¼ S., 1¾ miles distant, steer S.E. by E. ¼ E., 15½ miles, which brings you up with the Cross Rip light-ship; *if bound through Butler's Hole*, steer E. ½ S. 2½ miles, for the Black Buoy, No. 5, on the South-east point of the Horse-shoe, then E. by N. 9¼ miles, to the Black Buoy No. 7, on the S. point of the Handkerchief, thence E. by N. ½ N. 6¾ miles, to the Pollock Rip light-ship, from thence to sea. The course, if bound outside of all, is E. by S. ½ S.; if between the Rips, is N. by E. ½ E.

To go South of the Hedge Fence Shoal.

Nobska Point light bearing N.W. by W. ½ W., three-quarters of a mile distant, steer S.E. by E. 7¼ miles, which brings you midway between the Red and Black striped Buoy, on the East end of the Hedge Fence, and the Red Buoy No. 6, on the East end of the Squash Meadow Shoals; thence E. by S. ¾ S., 9⅝ miles, will bring you up with the Cross Rip light-ship. To go to sea, follow the directions in the preceding paragraph.

NOBSKA POINT LIGHT, 4 miles West of Falmouth, is 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 3½ miles; East end of Middle Ground, S.E. ¾ S., 2¾ miles; West end of Middle Ground, S.W. by S., 4 miles; Gay *Nobska Point light.*

Head light-house, S.W. ½ W., 12¾ miles; Tarpaulin Cove light-house, W.S.W, 6½ miles; Falmouth Wharf, N.E. by E., 3 miles; Seconset Point, E. ¾ N., 7 miles; N. W. part of the Hedge Fence, E.S.E., 4 miles; Cape Poge light-house, S.E. ¼ E., 11 miles; East Chop Holmes' Hole, S.E. 5 miles. Keeping the Nobska light open by the East Chop Holmes' Hole, will clear the old town flats.

L'Hommedieu Shoal. L'HOMMEDIEU SHOAL.—On the West end of this shoal is a red spar buoy No. 2, in 24 feet water, bearing from the light on West Chop Holmes' Hole E. ⅗ S., 2¾ miles; from Nobska Point light, N.E. by N., 3¾ miles; from Cape Poge light, N.W. by N., 8¼ miles. The shoal extends about 4½ miles in an East and West direction nearly, and on its Eastern extremity is placed a red spar buoy, No. 4, in 18 feet water, bearing from West Chop light, E. by N., 6 miles; from Nobska Point light, E. ¾ S., 8¼ miles; from Cape Poge light, N. ¼ W., 6 miles. The least water on this shoal is 3 feet at low-water.

Hedge Fence Shoal HEDGE FENCE SHOAL lies South of L'Hommedieu Shoal, and extends W.N. W. and E. S. E. about 3½ miles. On its Western end is a spar buoy, red and black horizontal stripes, and a similar one on its Eastern end, both in 22 feet water. The West buoy bears from West Chop light N.E. by E. ½ E., 2 miles; from Cape Poge light, N.W. ½ W., 7¼ miles; the East buoy from West Chop light, N.E. by E. ¼ E., 5 miles; from Cape Poge light, N.N.W. ½ N., 4 miles. The middle of this shoal is nearly dry at low-water.

Horse-shoe Shoal. HORSE-SHOE SHOAL lies about 3 miles to the Eastward of the above shoals, and extends about 7½ miles in a N.W. and S.E. direction, having a dry spot on its North-western extremity, and a second about 1½ mile S. by E. of the first. On the N.W. edge, near the above dry spot, is a red spar buoy No. 8, in 4 fathoms low-water. There is a black can buoy, No. 3, in 3½ fathoms, on the Western edge of the Southern part of this shoal, and a black nun buoy, No. 5, in 4 fathoms, on the Eastern edge; and about midway between the first and the red buoy No. 8, on the N.W. part of the Shoal, is a black nun buoy, No. 1, in 22 feet water. The shoal is about 1½ mile wide, but the Northern part extends East and West about 4 miles. A red spar buoy, No. 10, is placed on the Eastern part of the broken ground off the N.E. part of the Horse-shoe.

Edward's Shoal. EDWARD'S SHOAL lies about one mile S. ⅕ E. from Cross Rip light-ship, and extends North and South about three-quarters of a mile. Least water, 10 feet.

Long Shoal. LONG SHOAL.—S. W. ⅕ W. from Cross Rip light-ship is a red spar buoy, No. 6, on the N.E. part of this shoal, in 12 feet at low-water. The shoal extends about 2½ miles N.E. and S.W.; least water, 2 feet. The Southern part curves to the Eastward, extending in that direction about three-quarters of a mile to within one-eighth of a mile of the Western end of a shoal called the Shovelful, which lies East and West, 2 miles, between Long Shoal and Tuckanuck Shoal. Least water on Shovelful 3 feet.

Tuckanuck Shoal. TUCKANUCK SHOAL, on the North-eastern part of which is a red spar buoy, No. 12, bearing from Cross Rip light-vessel S.E. by E., 5½ miles distant, extends from its centre (which bears from the Cross Rip light-ship S. by E. ¼ E., 3¼ miles distant) S. by E. about 2¼ miles, and E. ½ N. about 4 miles, and is about 1½ mile wide, having spots on its Northern middle and Southern parts dry at low-water.

Nantucket, or Great Point light. NANTUCKET, or GREAT POINT LIGHT, on the N. E. point of Nantucket Island, is a fixed light, and is elevated 70 feet above the level of the sea.

The buoy boat bears N. 58° E., 3¾ miles from Nantucket, or Great Point light. It is in 4½ fathoms water. High water 12h. 03m.; rise 3 feet.

Nantucket cliff beacons are on the South side of the harbor, on high ground some distance from the shore. They are small pyramidal buildings, and contain fixed lights. Their only use is to assist vessels entering the harbor to pass the bar.

Nantucket Harbor. NANTUCKET HARBOR.—If the light-house on the South side of the harbor cannot be seen, bring the light on Brandt 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 point, and pass it as near as you please; or,

Bring the South light and the light on Brandt 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 of Brandt Point. Variation in 1850, 9° 45′ W.

From Brandt Point N.N.W. ½ W. 309 fathoms; then N. by W. ½ W. 100 fathoms; then N. 350 fathoms over the bar.

From the bar N. by W. ¾ W. 8½ miles, will cross Tuckanuck Shoal, in 17 or 18 feet water.

Bound over the Shoals of Nantucket from the Bar. 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 3¾ 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 3¾ miles to the N.N.E. of the point; then running East will carry you to sea midway, between McBlair's and the Great Round Shoal. 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.

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.

At the full and change of the moon, it is full sea at Nantucket at 12h. 18m.; rise, springs 4 feet 9 inches.

CAPE POGE LIGHT, on the N.E. point of Martha's Vineyard, is a fixed light, and 55 feet above the level of the sea. *Cape Poge light.*

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 37 feet above the level of the sea.

EDGARTOWN HARBOR.—Vessels bound Eastward, and wishing to enter Edgartown Harbor from the East end of Squash Meadow Shoal, will bring the Harbor light to bear S.W. by S., and Cape Poge light to bear S.E., then steer S.S.W., (they then 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 course will carry them up to the wharves. *Edgartown Harbor.*

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, leaving it on the starboard hand, which course 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. High-water, 12h. 17m., rises 2 feet.

HOLMES' HOLE LIGHT is a fixed light, 60 feet above the sea, on the West Chop of Holmes' Hole. *Holmes' Hole light.*

HOLMES' HOLE.—Entering this harbor from the Westward, East Chop well open with West Chop light-house, clears you of the middle ground. Give the West Chop a berth of half a mile, until you are past the buoy off Low Point. The chart will then be the best guide. You can beat in with perfect safety, the shores being bold and clear. Ships may anchor in 3½ fathoms, mud; West Chop light just open with woods on Low Point. Small vessels may anchor further in, and immediately off the town. High-water, full and change, 11h. 48m. Spring tides rise 2 feet. *Holmes' Hole* *High-water.*

Holmes' Hole beacons are fixed lights, red, white, and green, respectively. Red and white lights range for the West entrance; green and white lights range for the East entrance.

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. W. end of which is a red can buoy, placed in 22 feet water, bearing from Cape Poge light N.W., 4¼ miles; from West Chop light, S.E. by E. ¼ E., 3½ miles; and from the red and black buoy on S.E. part of Hedge Fence, S.S.E. ¼ E., 2 miles. Shoalest water 5 feet. The buoy lies about 2 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 may 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.

The shoals of Nantucket, between Great and Monomoy points, have been surveyed by Lt. C. R. P. Rodgers, of the U. S. Coast Survey, with great fidelity. The passage between the Great and Little Round Shoals was found to be full of narrow sand-ridges lying parallel to one another, and having a N.N.W. and S.S.E. direction, with spots of 8 feet.

Bearings.

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 bearings of the East Chop of Holmes' Hole.

East Chop	N.W. ¼ W. from said light, 6 miles distant.				
Squash Meadow Shoal	N.W., 5 feet at low-water,	5½	do		
Norton's Shoal, buoy on N.E. part	E. ½ S., 9 feet at low-water,	5½	do		
Muskeget Long Shoal	E. by S. ½ S., 6 feet at low-water,	5¾	miles distant.		
Tuckanuck Shoal	E. by S. ½ S., 7 do	do	10½	do	
South end Horse-shoe, black buoy	E. ½ N., 7 do	do	10	do	
Dry Spots Horse-shoe	N.E. ½ N.,	do	6½	do	
Swash of Horse-shoe	E.N.E., 12 do	do	6½	do	
Tuckanuck Shoal from Nantucket light,	W. by N., 7 do	do	9½	do	
Horse-shoe from do	N. W. by W.,		9½	do	
Course from Nantucket light bound Westward,	W. by N. ½ N.,				
From Cape Poge to Skiff's Island	S. ¼ W., dry,		5¼	do	
Hawe's Shoal, the shoalest part	S.E. ½ E., 6 do	do	2¾	do	

Muskeget Channel.

MUSKEGET CHANNEL.—Coming from the Northward, pass half a mile to the Eastward of the buoy off Cape Poge, and bring Cape Poge light and Edgartown spire in range, then steer S. ½ W., leaving the buoy on the Hawes Shoal on the port hand and Tom's Shoal buoy on the starboard hand. Continue this course 6 miles, when you will suddenly deepen your water to about 17 fathoms, with the buoy on Mutton Shoal ahead of you, about half a mile distant, and the church on Sampson's Hill bearing N.W. ¾ N., then steer S.W. ¾ S., between Mutton Shoal and Skiff Island or Shoal, leaving the former on your port hand. Continue this course one mile, until Wasque Bluff bears N. by W., when any course from S. to S.S.W., 4 miles, will clear all dangers. The shoal water off Cape Poge extends about two-thirds of a mile: a spar buoy is placed on its Eastern edge.

Hawes Shoal has as little as 4 feet water. Its Northern end is about 1¾ mile E. by N. from Cape Poge; its Southern end, 2¾ miles S.S.E. ¼ E.

Mutton Shoal has 7 feet water on it. A spar buoy is placed on its Western edge, 3 miles S.S.E. ½ E. from Wasque Bluff.

Skiff Island or Shoal is low, surrounded by shoals, bearing S.S.E., ½ E. 1¼ mile from Wasque Bluff.

Wasque Shoal extends S.W. from the bluff 3½ miles from the shore, and has 17 feet water on it. Do not approach too near the shoals off Muskeget Island. Muskeget channel should not be attempted at night.

NANTUCKET OLD AND NEW SOUTH SHOALS, &c.

Sankaty Head light.

SANKATY HEAD LIGHT is 150 feet above the level of the sea, the tower is 65 feet high, painted with two white and one red rings, horizontally, the red being in the centre; it is a fixed light, varied by flashes, when seen at the distance of 12 miles or less, beyond that it is a flashing light, with flashes of 10 seconds duration at intervals of 50 seconds. It bears S. by E. 9 miles from Long Point light, and from the centre of the New South Shoal, N. ½ W., 19½ miles.

Old Shoal.

*OLD SHOAL.—This dangerous shoal, which lies in lat. 41° 04′ N., long. 69° 51′ W., bears S. by E. from Sankaty Head light 13½ miles. 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.

South from the old 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 five

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* 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, New-York.

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 Shoals 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.

"Sankaty Head bearing	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.
Siasconset town	N.W. ½ N.	
Southernmost land	W.	

"Sankaty Head bearing	N. by W.	On the South breaker of Bass Rip, in 9 and 8 feet and less.
Siasconset	N.N.W.	
Tom Never's Head	N.W. by N.	
Southernmost land	W.N.W.	

"Kept standing on to the Southward in a channel of from 6, 7, and 8 fathoms, Sankaty 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, 3 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 W. Although they have the appearance of danger, there are not less then 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 sounding gradually to 10 fathoms, fine black and white sand, then one mile from the shoal. From this sounded every 3 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 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 latitude 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. 12 miles, to 30 fathoms; N.W. 20 miles, to 18 fathoms; S.S.W. 10 miles, to 30 fathoms; and N.N.W. 14 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."

New South Shoal.

NEW SOUTH SHOAL.—This dangerous shoal has on it only 8 feet in places, and bears from the middle of the Old Shoal from S. ½ W. to S.S.W. ¼ W., by compass, distance 6 $\frac{4}{10}$ miles. It is 2 $\frac{3}{10}$ miles long from East to West; and its greatest breadth, from North to South, nine-tenths of a mile.

Between it and the Old Shoal there are from 4 to 18 fathoms water; but to the North and East there are ridges of only 20 to 24 feet water, to the extent of about 3 miles from the New Shoals. Deep water intervenes between these ridges, and the soundings on the ridges are very irregular.

The tide rips show that two, and perhaps three, lines of shoal ground are near each other, in parallel directions. The latitude of the centre of the New Shoals

is 40° 57′ 50″ N., longitude 69° 51′ 40″ W., and bears from Sankaty Head S. ½ E., 19½ miles.

Tides. The tides set regularly round the compass, the main body of the flood running to the Eastward, and the ebb to the Westward, varying North and South of East and West.

But the flood begins to turn to the Southward, passing round to the West, and ebb to the Northward, passing round to the East, about 1½ hour before the principal set and strength are attained.

Upon the shoals the tides always run across their line of direction, and are much more rapid, which makes an approach on the side to which the tide is setting very dangerous.

The tide is never still; at even slack water its velocity is seldom less than half a mile, and on the second quarter of the flood and ebb it sets at the rate of two knots.

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 and numerous shoals.

There is a light-vessel in 17 fathoms water, about one mile to the South of the Southern extremity of this shoal in latitude about 40° 56′ 30″ N., longitude 69° 51′ 30″ W. She has two masts, painted yellow, white mast-heads, with open work at an elevation of 63 feet. The hull of the vessel is red. Two lights are shown at an elevation of 44 feet, and can be seen in good weather about 12 miles from an elevation of 15 feet above the sea.

There is a bell which will be tolled in foggy weather.

Vessels bound to the Westward, after passing the light-vessel, may steer the following courses and distances:

For Tom Nevers Head, N. 26° W.	21 miles.
" Block Island light, W.N.W.	78 "
" Light-vessel off Sandy Hook, W.	180 "

being careful to use the log and lead frequently, particularly in thick weather.

Vessels bound to Boston Bay, or that vicinity, with moderate weather, may, after passing the light-vessel, steer E.N.E., 18 miles; this leaves the Fishing Rips on the starboard hand, from thence N. by W. ½ W., 38 miles, which brings them up with Chatham lights.

Pochick Rip. 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 cables 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.

Bass Rip. BASS RIP, on which there are from 4 to 18 feet water, is 4 miles long in a N.N.E. and S.S.W. direction, the N.E. point bears E. 10 S. from Sankaty Head light, 3 miles distant. On it there is a white buoy boat, with Bass Rip in red letters on each side. It has one mast, with red hoop iron day-mark.

From Sankaty Head light, North by the way of East, to the South, a sweep of 19 miles, the ground is broken and full of dangerous shoals, from 9 feet upwards. Vessels of 9 feet or over, should not attempt to navigate within this extent without a pilot.

The following are from the U.S. Coast Survey:

1. A dangerous ridge near the New South Shoal, lying in a N.N.E. and S.S.W. direction, having on it 4, 5, and 6 fathoms, and deepening very rapidly outside to 20 and 25 fathoms, and inside to 13 fathoms, on which the sea breaks in bad weather.

The following bearings are taken from the centre of this rid[illegible] Centre of New South Shoal, W. by S., distant 4 miles; the middle of the Old S[illegible]oal, N. ¾ W., distant 6 miles.

2. A shoal spot with 16 feet of water on it in the channel-way to the Eastward of Bass Rip, from which Sankaty Head bears W.N.W. ¾ W., distant 4½ miles; and Great Point light N.W. ¼ N., distant 10¾ miles.

3. A shoal having 14 feet of water on it to the Southward and Eastward of Great Point light, and North of Bass Rip, from which Sankaty Head bears S.S.W. ½ W., distant 4½ miles; and Great Point light N.W. by W. ¼ W., distant 5¾ miles.

Four shoals, having on them from 9 to 15 feet, bearing from Great Point light E. ¼ S., from $10\frac{7}{10}$ miles to 9½ miles distant. From Sankaty Head light they bear N.E. ¾ E., from $9\frac{6}{10}$ miles to $9\frac{6}{10}$ miles distant. They are named McBlair's Shoals, from the discoverer.

These shoals can readily be discovered by the rip (or ripples) formed on them by the tides at all stages, except during slack water, when they can no longer be detected by this means; but in daylight they exhibit the usual discoloration of water.

Two small spots of 18 feet water: one bears from Great Point light E. ½ S., $9\frac{8}{10}$ miles distant; from Sankaty Head light, N.E. ⅓ E., $9\frac{4}{10}$ miles distant.

The other from Great Point light, E. ½ S., $11\frac{2}{10}$ miles distant; from Sankaty Head light, N.E. ⅓ E., 10½ miles distant.

GREAT RIP is 13 miles long, and runs nearly N. ½ E. by S. ½ W. The Northern Point, of 5 fathoms, bears from Sankaty Head light E. by N. ½ N., distant 10¾ miles. On it there is a white buoy boat with Great Rip in black letters on each side; one mast topped with a cedar bush. *Great Rip.*

THE SOUTHERN POINT, of 6 fathoms, bears from Sankaty Head light S.E. ½ S., distant 15 miles. *The Southern Point.*

THE ROSE AND CROWN.—The shoal ground on the North end of the rip, having as little as 7 feet water, is 4 miles in extent. The North end bears from Sankaty Head light E. ¼ N., 10½ miles distant. *The Rose and Crown.*

The South end of the Rose and Crown bears from Sankaty Head light E.S.E. ¼ E., distant 10½ miles.

On the South end there is a slue of 4 fathoms, and three-quarters of a mile wide. From thence to the South end of the Great Rip the ground is broken, having as little as 4 feet water.

DAVIS' BANK.—There is a channel of from 7 to 20 fathoms between the Great and Fishing Rips, of 12 miles in width. In this channel, S. 44° E., 18½ miles distant from Sankaty Head, is a spot of 3½ fathoms, on what is called Davis' Bank. This bank has an extent of 13¼ miles, in a N. 25° E. and S. 25° W. direction; and 4½ fathoms is the least water, except in the above place. *Davis' Bank.*

THE FISHING RIP, on which there are from 4¼ to 10 fathoms water, is 15 miles in extent from its N.N.E. to the S.S.W. point. *Fishing Rip.*

The N.N.E. point bears from Sankaty Head light S.E. by E. ¾ E., distant 25 miles; the centre of 6 fathoms bears S.E. ¾ E., distant 30 miles; the S.S.W. point, S.E. ¾ S., distant 28½ miles.

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. *Tides.*

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.* *Block Island Channel.*

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. point of Block Island to Gay Head light-house is E. by N., 34 miles. Variation in 1850, 8° 30′ W. The current in Block Island Channel is N.N.E. and S.S.W., two knots. If you are to the Southward of Martha's Vineyard, and can see Noman's Land, and intend going over the shoal to the Eastward, bring Noman's Land to bear

W. and steer E. by S., 8 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 2 fathoms water, and bears from the South Tower of 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 Sankaty Head, which is the highest Eastern land of Nantucket. Bring Sankaty 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 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 Sankaty Head bears N.N.W. ½ W., where you will have 9 fathoms water, when you will run direct for Sankaty 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.

The above directions are only for vessels under 10 feet.

When you pass the New South Shoal, bound to Boston Bay, to go to the Eastward of all the shoals and rips, 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 20 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.

Muskeget Channel. MUSKEGET CHANNEL.—South of Nantucket, and between it and the Vineyard, and wishing to make a harbor, you may pass through the channel to the Westward of Nantucket Island, by bringing Cape Poge light-house to bear from N. to N. by W., and steering from N. to N.N.E., until up with the red buoy on Mutton Shoal, which you leave on the starboard hand, then N.E. by N. until abreast of Skiff's Island or Shoal, when a N. ½ E. course will carry you clear to Cape Poge light, passing a red buoy on the S.W. part of Hawes Shoal on your starboard hand, and a black buoy on Tom's Shoal on your port hand.

Gay Head light-house. GAY HEAD LIGHT-HOUSE stands on the South-west end of Martha's Vineyard, on a remarkable promontory, called Gay Head; elevation of light above the sea 191 feet. It is a revolving Fresnel light of the first order, showing a bright flash of the natural color every 10 seconds. It should be seen about 19 miles.

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.

Light. Cape Poge light, at the N.E. point of the Vineyard, may be seen over the land from sea; it is a fixed light, to distinguish it from Gay Head; also Cuttyhunk light, at the N.W. part of Cuttyhunk Island, South entrance of Buzzard Bay, which is also a fixed light. The Devil's Bridge, a rocky shoal, makes off about N.W. from the light, 1½ mile distant.

Noman's Land. Bearings and distance 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, 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. Beaver Tail, W. by N. ½ N., distant 20 miles.

To enter the Vineyard Sound, bring Gay Head light to bear E.S.E., 4 miles distant, and steer N.E. by E. ¾ E.

Quick's Hole. To enter Buzzard's Bay through Quick's Hole, bring Gay Head light to bear S. ¾ W., and steer N. ½ E. to the entrance of Quick's Hole, which is 6 miles from Gay Head. Menemsha Bight, which lies on the North side of Gay Head, affords a 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 Cuttyhunk Island bears N. 45° W., distant 7¼ miles.

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. 3 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. You can anchor in this harbor in from 4 to 2½ fathoms, taking care to avoid two rocks, one on the North, the other on the South side of the harbor. To avoid the Northern one, of 14 feet, do not bring the light to bear to the South of S.S.W.; and to avoid the other, of 13 feet, do not bring the light to bear South of S. ½ W. *Tarpaulin Cove.*

TARPAULIN COVE LIGHT lies on the port 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. *Tarpaulin Cove light.*

There is a shoal of 13 feet, 2½ miles S. by E. ½ E. from Tarpaulin Cove. One-third of a mile N.E. from the light-house there is a rock of 7 feet water, on which there is a black buoy. High-water, full and change, 11 45.

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 N.W., 1½ mile distant. On its outer edge is a red buoy, No. 2. 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 red and black buoy on the East end, in 16 feet water, bearing from Tarpaulin Cove light E., 7 miles; from West Chop light, N.W. by W., half a mile; and from the East buoy on Hedge Fence, W. ½ N., 5¼ miles, (shoalest water on Middle Ground, 2 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 in 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 2 miles deep, you will lie secure from all winds, except a Northerly one.

You must not keep further than 2 miles from the West Chop, as there is a shoal called Hedge Fence, on the East end of which is a red and black buoy, in 16 feet water, bearing from West Chop East, 5 miles, and from the black buoy on Middle Ground E. ½ S., 5½ miles. The Hedge Fence lies about 3½ miles N.E. by N. from Holmes' Hole light, and extends W.N.W. and E.S.E. 3½ 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 fathoms. If, in running S.E. by E., you fall into 6 or 7 fathoms, haul up S. by 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 3¾ or 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 Cuttyhunk light on the port 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. Cuttyhunk is one of the Elizabeth Islands.

CUTTYHUNK LIGHT stands on the South-west part of the island, at the entrance of Buzzard's Bay. It is a fixed light, elevated 42 feet above the sea. *Cuttyhunk light.*

SOW AND PIGS.—The floating light off Sow and Pigs is moored in 9 fathoms water, 2 miles from Cuttyhunk light-house. It shows two fixed lights, 34 and 23 feet above the sea. At the distance of half a mile North-easterly from the light-vessel, there are 3½ fathoms water on the Sow and Pigs, between which point and the light-vessel there is a safe channel. One mile North-easterly from light-vessel the rocks dry at half ebb. *Sow and Pigs.*

Gay Head	$7\frac{2}{10}$	miles,	S.E. by E. ¼ E.
Cuttyhunk	2	do.	N.E. by E. ½ E.
Old Cock Rock	$4\frac{2}{10}$	do.	N. by W. ¾ W.
Dumpling Light	9	do.	N.E. by N. ¼ N.

Bearings from Cuttyhunk Light-house.

West part of Sow and Pigs, very dangerous	S. 56° W.	2½ miles.
Seaconset Point Rocks	N. 71° W.	13 do.
Old Cock, a rock North side entrance Buzzard's Bay	N. 42½° W.	5 do.
Mishaum Point	N. 8° E.	6½ do.
Dumpling Rock light-house	N. 20° E.	8½ do.
Clark's Point light-house	N. 21° E.	12½ do.
West Point Penikes Island	N. 38° E.	3 do.
Gay Head light-house	S. 43° E.	6 do.

In entering Buzzard's Bay, bring Cuttyhunk light to bear East, 3 miles distant, and steer N.E. by N., which course will carry a vessel to good anchorage, at 6½ and 7 fathoms, about one mile from the Dumpling 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.

Vineyard Sound.

VINEYARD SOUND.—[Variation, in 1850, Western part, 9 degrees W.; Eastern part, 9 deg. 20 m. W.]—In coming into the Sound in the night with a strong Northwesterly 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 Lombard's Cove, in which is good anchorage, with Southerly or Easterly winds, and may be known by a high sand-bank, called Nikonikey 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 Nikonikey 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, 6½ miles 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 the West Chop light N.W. by W. half a mile, and from the East end of the Hedge Fence, W. ½ N. 5½ miles. There is good anchoring along this shore, in 6 or 4 fathoms, after you are to the Eastward of Nikonikey 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 3 miles, and run S.E. till you come into 7 fathoms water, which will be on the East side of the bay in Menemsha, 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. 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 Nikonikey Cliff are 3 and 4 fathoms across the ground. Opposite Lombard'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 S., distant 7 miles. In steering this course, you must have regard to the tide, as the ebb may set you too far to the Southward, 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 S.E., and the distance about 7½ miles; in the channel between them there are 12 and 11 fathoms water. In going over the shoals through this channel, you must be careful to keep your lead going.

New-Bedford, through Quick's Hole.

NEW BEDFORD, THROUGH QUICK'S HOLE.—Bring Gay Head light-house, which contains a revolving light, to bear S. ¼ W., and run N. ½ E. till you come to the passage through the islands which form 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 port hand, when you will have from 5 to 6 fathoms, then haul square into the Hole, keeping the port 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, until 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, to New Bedford Harbor.

NEW BEDFORD HARBOR, ROUND HILL CHANNEL.—Running in from the Southward and Westward, bring Mishaum Point to bear W. by S., and White Rock a ship's length open to the Eastward of Dumpling light, and steer to the Northward, leaving the red can buoy, No. 4, on Sand-spit, on the starboard hand, and the black spar buoy off Dumpling Rock on the port hand, and keeping the Rock more open as you advance, so as to pass a quarter of a mile East of the light. *New-Bedford Harbor, Round Hill Channel.*

When the light bears W. by N. steer N.E. by N. 2½ miles, leaving the red and black buoys on Middle Ledge and Inez Rock on your port hand, until Clark's Point light is in range with Palmer's Island light, then steer for the beacon on Egg Island Flats, N. by E., nearly 2 miles, leaving the black buoy on Old Bartlemy on your port hand, until Palmer's Island light is in range with the tall chimney of the Wamsutta Factory; steer for them, passing the black buoys on Butler's Flats and Eleven Feet Bank on your port, and the red buoys on Egg Island Flat and Fort Flat on your starboard hand until up with the Southern end of Palmer's Island, then steer for the ends of the Fairhaven wharves, passing a red buoy on the North end of Fort Flats on your starboard hand, until you are half-way between them and Palmer's Island light, then steer for the most Northern spire in New Bedford, and anchor near the town.

N. B.—Wamsutta Factory is a large stone building, with a very tall chimney on its Eastern side; it is in the Northern part of the town, and may be seen over Fairhaven bridge.

CHANNEL BETWEEN NORTH AND GREAT LEDGES.—Run in through this channel, keeping Palmer's Island light open a handspike's length to the Eastward of Clark's Point light, until you are 1¼ mile from the latter, then steer for the beacon on Egg Island Flats, and proceed as above directed. On the above course you will pass a black buoy on the Eastern part of Great Ledge on your port hand, and a red buoy on Decatur's Rock on your starboard hand. *Channel between North and Great Ledges.*

EASTERN CHANNEL.—Bring the white beacon on Fort Point in range with the high dark spire in Fairhaven, and steer for them until Palmer's Island light and the tall chimney before mentioned are in range, then steer as above directed. On the above course you will pass Hursell Rock and Packet Rock red buoys, and Henrietta Rock striped buoy on your starboard hand, and the black buoy on North Ledge on your port hand. *Eastern Channel.*

PALMER'S ISLAND LIGHT is on the N.E. point of Palmer's Island. It is 32 feet high, and a fixed light. With it in range with Clark's Point light, you clear all the ledges outside. *Palmer's Island light.*

In the river, Palmer's Island light on with the most Northern mill chimney, leads out of the river clear of danger.

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 Penikes 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 Penikes Island, about one mile distant, on which there are only 8 feet at low-water. Between this and Wilkes' Ledge (on which there is a 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 and Hen and Chickens a sufficient berth, the only danger to be avoided in approaching Mishaum Point is a rock which lies about five-sixths of a mile S.W. from it, on which there are only 6 feet water. Having passed Mishaum Point, S.W. of which, three-quarters of a 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 Dumpling Rock light, off the Round Hill, 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 direct course from the outer Dumpling 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 port 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.

DUMPLING ROCK LIGHT is on one of the Dumpling Rocks in Buzzard's Bay, 3½ 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, 42 feet above the sea. Buoy on Middle Ledge, N.E. ¼ N., 1½ mile; buoy on North Ledge, N.E. ½ E., 2½ miles; buoy on Great Ledge, E. ¼ S., one mile; Wood's Hole, E. by S. ¼ S., 11 miles; Quick's Hole, S. by E. ¼ E., 6 miles; buoy on Wilkes' Ledge, S. ½ E., 1¼ mile; Penikes Island, S. by W., 6 *Dumpling Rock light-house.*

miles; Cuttyhunk light-house, S.S.W. ¼ W., 7½ miles; Sow and Pigs, S.S.W. ½ W., 9 miles; Mishaum Point, S.W. by W., 2 miles; White Rock, N. ½ E., two-thirds of a mile. High water, 7h. 59m., rise 4 feet.

High-water.

When bound to sea, a S.W. by S. course from the Dumpling Rocks light will carry you just without the ledge South of Mishaum Point, and in a fair channel-way between the Sow and Pigs and Hen and Chickens.

Hen and Chickens.

HEN AND CHICKENS.—There is a bell buoy off this ledge in 7 fathoms water. The bell is elevated 5 feet above the water, and can be heard about one mile. The following magnetic bearings are given:

Sow and Pigs light-vessel	S. by E.
Seconet Point	W. ½ N.
Entrance to Westport Harbor	N.W. by N.
Old Cock	N. by W.

From Seaconset 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 Cuttyhunk 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 Dumpling 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 Mishaum Point and the Round Hills, and come to anchor, or otherwise steer N.N.E. till Penikes 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 Seaconset Point towards Cuttyhunk 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 Cuttyhunk, 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.

To the S.E. of the Dumpling 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. A red buoy, No. 4, is placed on the East end of the spit.

The soundings across the Western entrance of Buzzard's Bay, between the Sow 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.

Monumet River.

MONUMET RIVER.—Sailing for Monumet River, the best water is near to Wenaumet Neck, and from the point of Wing's Neck nearly up to the Southernmost of Tobey's Islands, are from 4 to 6 fathoms water. Nearly to the Island (Tobey's) 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 29 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 10 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, at 8 o'clock. Variation, in 1850, 9° 45′ West.

Bird Island is on the Eastern 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 5 feet above the level of the sea. The light and dwelling-houses are built of stone, and are whitewashed. The light is 35 feet high; it is a revolving light, time of revolution 3½ minutes.

Light.

Bearings and distances from Bird Island light-house.

The South point of West's Island	S.W. ¼ S. 7 miles.
West's Island Ledge (black buoy)	S.W. ¾ S. 7½ miles.
The North entrance of Quick's Hole	S.W. by S. 14 miles.
Wood's Hole, due	S. 9 miles.
The entrance of Monumet River	E.N.E. ½ N. 6 miles.

Bearings and distances of sundry places in the vicinity of Buzzard's Bay.

From Wenaumet Neck to the light-house on Bird Island	W. ½ S. 2½ miles.
Minister's Neck	S. by E. ½ of a mile.

From Great Rocky Point to the South end of Mashne Island. S.W. ½ W. ⅜ of a mile.
Hog Island.....W. by S. ½ of a mile.
Wenaumet Neck .....S.W. 3 miles.
Tobey's Island.....S.S.W. ¾ of a mile.
Old Cow Rock.....S. by E. ½ E. ½ of a mile.
From the South end of Mashne Island to Bird Island.....S.W. by W. ½ W. 4½ miles.
Wenaumet Neck.....S.W. ½ S., 2⅜ miles.

Wareham Harbor, in Buzzard's Bay.

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, which are 17 in number, leaving, in going in, the red buoys on the starboard hand, and the black on the port.

Ned's Point light-house.

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 whitewashed, standing 45 feet from the sea, to the S.W., and 250 feet from the sea to the S.E. The lantern is elevated 43 feet.

Bearings and distances from Ned's Point light-house.

A red and black buoy on Nye's Ledge, S.S.E., ¼ S., distant 2¼ miles.
A black buoy on S.E. point of Mattapoisett Ledges, S. ½ E., distant 1⅞ of a mile.
A buoy on Snow's Rock, S. 10° E., distant 3¼ miles.
A buoy on N.W. part of Mattapoisett Ledge, S. 3½° W., distant 1½ mile.
Cormorant Rocks, S. ¾ W., distant 3 miles.
Angelica Point, S.E. by E., distant 1½ mile.
Wood's Hole, S.E. ¾ E., distant 9 miles.

Mattapoisett.

MATTAPOISETT.—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. ½ W., when you may haul up N.W. ½ W. In running this course, you will pass a red buoy on your port hand, which stands on the middle of Nye's Ledge; this ledge is about a quarter of a mile over, either way, and not more than 8 feet water on some parts of it. Continuing this course, you will pass a black buoy on your port hand, which stands on the S.E. part of Mattapoisett Ledge, in 2½ fathoms of water. Continue the above course and you will pass 2 buoys, one on your starboard and the other on your port hand: the latter stands on the East side of the Sinking Ledge, in 3 fathoms of water; the former stands by the side of the Snow Rock, in 2½ fathoms of water. This rock has 8½ 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 3 fathoms water, good bottom.

Beacons and Buoys arranged as they are passed by vessels going up Buzzard's Bay by the West Channel, and into New Bedford and Fairhaven Harbors, after passing the Sow and Pigs light-vessel.

NAME OF STATION.	COLOR.	NO.	DESCRIPTION.	BEARINGS FROM BUOY OR BEACON.	REMARKS.
Sow and Pigs	Red	2	Can buoy with "Sow & Pigs" on head	Gay Head light, S.E. by E. ½ E.; Ribbon Reef buoy, N. ½ E	in 25 feet, low-water.
Old Cock			Rock	Sow and Pigs light-boat, S. by E.	3 feet above high-water.
Ribbon Reef	Red & black hor. stripes		Nun buoy	Dumpling Rock light, N.N.E., ¾ E.	in 4 fathoms, low-water.
Mishaum Ledge	Black	1	"	" " N.E. ¼ E.	" 18 feet, low-water.
Wilkes' Ledge	Red & black hor. stripes		Can buoy	Sand-spit buoy, N	" 15 " "
Salter's Point Ledge	Black	3	Spar buoy, 35 feet	" " E. by N	" 15 " "
Sand-spit	Red	4	Can buoy	Wilkes' Ledge buoy, S.	" 18 " "
Dumpling Rock	Black	5	Spar buoy, 40 feet	Salter's Point Ledge buoy, S.W. by W. ¼ W.	" 18 " "
Do. Light-house	White		House with lantern on top, fixed light.	Clark's Point light, N.N.E.	On rock off Round Hill.
Great Ledge, West part	Red	6	Spar buoy, 40 feet	Wilkes' Ledge buoy, S.W. by S. ½ S.	in 18 feet, low-water.
Middle Ledge	Red & black hor. stripes		" 40 feet	Great Ledge buoy, West end, S. by E. ¾ E.	" 18 " "
Inez Rock	Red & black hor. stripes		" 35 feet	Lone Rock buoy, W.S.W. ¼ W.	" 15 " "
Commodore Decatur's Rock	Red	8	" 40 feet	Clark's Point light, N. ½ W.; Great Ledge East part buoy, S. by W. ½ W.	" 18 " "
Clark's Point light	White		Tower 48 feet high, fixed light		The West side of the entrance to New Bedford Harbor.
Old Bartlemy	Black	7	Spar buoy, 40 feet	Round Hill light, S.S.W. ¼ W.	in 18 feet, low-water.
Butler's Flat	Black	9	" 40 feet	Old Bartlemy buoy, S.S.W. ¼ W.	" 18 " "
Egg Island Flat	Red	10	" 30 feet	11 Ft. Bank, N.W. by W.	" 12 " "
Egg Island Beacon	White		Granite beacon, spindle & vane on top.	Range Beacon, N. by W. ½ W.	Dry.
Eleven foot Bank	Black	11	Spar buoy, 30 feet	Fort Flat buoy, N. by W.; Old Bartlemy buoy, S. ¼ E	in 12 feet, low-water.

NAME OF STATION.	COLOR.	NO.	DESCRIPTION.	BEARINGS FROM BUOY OR BEACON.	REMARKS.
Range Beacon	White		Wooden Triangular Pyramid, 40 ft. high	Clark's Point light, S. ¾ W.	On Fort Point.
Fort Flat, South part	Red	12	Spar buoy, 35 feet	End of Railroad Wharf, N.	in 15 feet low-water.
Palmer's Island, South part	Black	13	" 35 feet	Egg Island Flat buoy, S.E. by S	" 15 " "
Fort Flat, North part	Red	14	" 35 feet	Dix' Ledge buoy, N. by E.	" 15 " "
Palmer's Island, North part	Black	15	" 35 feet	Fort Flat South buoy, S. by E. ¼ E.	" 15 " "
Palmer's Island light	White		Tower 28 feet high, fixed light		West side of entrance to New Bedford Harbor.
Dix's Ledge	Red	16	Spar buoy, 35 feet	Palmer's Island buoy, S. end, S. by W. ¼ W.	In 15 feet, low-water.
Going up to New Bedford and Fairhaven between Packet Rock and North Ledge, after passing Great Ledge.					
Great Ledge, East part	Black	1	Spar buoy, 40 feet	Inez Rock buoy, N. by W. ¼ W.	in 18 feet, low-water.
North Ledge	Black	3	" 40 "	Egg Island beacon, N. ¼ E.	" 18 " "
Henrietta Rock	Red & black hor. stripes.		" 40 "	Packet Rock buoy, N. ¾ E.	" 20 " "
Packet Rock	Red	6	" 35 "	Old Bartlemy buoy, N.W. ¾ W.	" 15 " "
For Entering Eastern Channel from the Eastward, after passing West Island Ledge.					
West Island Ledge	Red	2	Spar buoy, 40 feet	Clarke's Point light, N.W. ½ W	in 15 feet, low-water.
Mosher's Ledge	Red	4	" 40 "	West Island Ledge buoy, E. ¼ N.	" 18 " "
For Going into Dartmouth, after passing Middle Ledge Buoy.					
Hussey's Rock	Black	1	Spar buoy, 35 feet	Sand Spit buoy, S.E. by E. ½ E.	in 15 feet, low-water.
Lone Rock	Red & black hor. stripes.		" 40 "	Inez Rock buoy, E.N.E. ¼ E.	" 18 " "
Channel Rock	Red	4	" 30 "	Hussey's Rock buoy, S.S.E. ¼ E.	" 12 " "
Bent's Ledge	Red	2	" 40 "	" " " S.W. ½ S.	" 17 " "
For Going into Mattapoisett Harbor, after passing West Island Ledge Buoy.					
West Island, S.E. part	Black	1	Can buoy	Dumpling Rock light, W. by S.	in 20 feet, low-water.
Cormorant Rocks			Rock	West Island, S.E. Point buoy, S.W. by S.	Dry.
Nye's Ledge	Red & black hor. stripes		Spar buoy, 35 feet	Mattapoisett Ledge buoy, N.W. by N.	in 14 feet, low-water.
Mattapoisett Ledge	Black	3	" 40 "	Gallitin Rock buoy, N. by W. ¼ W.	" 18 " "
Snow's Rock	Red	2	" 30 "	Barstow's Rock buoy, N. by W. ½ W.	" 15 " "
Barstow's Rock	Red	4	" 30 "	Ned's Point buoy, N.	" 15 " "

For going into Mattapoisett Harbor after passing West Ledge Buoy.

NAME OF STATION.	COLOR.	NO.	DESCRIPTION.	BEARINGS FROM BUOY OR BEACON.	REMARKS.
Ned's Point	Red	6	Spar buoy, 30 feet	Landing Rock buoy, N.W. ½ W.	in 16 feet, low water.
Ned's Point light	White		Tower 32 feet high, fixed light		on North side of Harbor.
Landing Rock	Red	8	Spar buoy, 25 feet	End of Long Wharf, N.W. by W.	in 12 feet, low water.
West Channel for Mattapoisett Harbor after passing West Island Ledge Buoy.					
Gravel Island (South end)	Black	1	Spar buoy, 20 feet	Cormorant Rocks, S.S.W.	in 6 feet, low-water.
Lone Rock	Black	3	" 25 "	Gallitin Rock buoy, S.E. ¾ E	" 12 " "
To mark the entrance to Sippican Harbor after passing Bobel Ledge.					
Bobel Ledge	Black	1	Spar buoy, 35 feet	Nye's Ledge buoy, S.W.; Angelica Point, S.W. by W. ¾ W.	in 15 feet, low-water.
Bird Island light	White		Tower 29 feet high, revolving light	Eastern side of entrance to the Harbor.	
Charles Neck	Black	3	Spar buoy, 40 feet	Bird's Island light, S.E. ½ E.	in 18 feet, low-water.
Black Rock	Black	5	" 30 "	Charles Neck buoy, S. by E. ½ E.	" 12 " "
Ram Island Point	Red	2	" 25 "	Black Rock buoy, S. by W.	" 12 " "
Going into Wareham Harbor after passing Bird Island Light.					
Bird Island	Black	1	Spar buoy, 40 feet	Wing's Cove buoy, N. ½ E.	in 18 feet, low-water.
Dry Ledge	Red	2	" 35 "	Great Flats buoy, N.W. ½ N.	" 15 " "
Wing's Cove	Black	3	" 40 "	Bird Island buoy, S. ½ W.	" 18 " "
Great Flats	Red	4	" 30 "	Yantic R. flat buoy, N.N.W. ½ W.	" 12 " "
Yantic River Flat	Black	5	" " "	Middle Ledge S.W. buoy, N.E. by N.	" 14 " "
Middle Ledge, S.W. part	Red	6	" " "	Cromesset Pt. Ledge S.W. buoy, N.E by E.	" 12 " "
Cromesset Pt. Ledge, S.W. part	Black	7	" " "	Middle Ledge N.E. buoy, E.	" 12 " "
Middle Ledge, N.E. part	Red	8	" " "	Cromesset Pt. Ledge S.W. buoy, W.	" 12 " "
Cromesset Pt. Ledge, N.E. part	Black	9	" " "	" " " S.W. by W.	" 12 " "
Fox Rocks	Black	11	" " "	Middle Ledge S.W. buoy, S. ¾ W.	" 12 " "
Swift's Flats, lower part	Black	13	" 25 "	Swift's Flats upper buoy, N.E. ¼ N.	" 9 " "
Do. do. upper part	Black	15	" " "	Quahaug Bar buoy, N. by W. ¼ W.	" 9 " "
Quahaug Bar	Red	10	" " "	Cotuit Point, N.N.E. ½ E.	" 9 " "
Turn of the Channel	Black	17	" 20 "	" " S.S.W.	" 6 " "

NAME OF STATION.	COLOR.	NO.	DESCRIPTION.	BEARINGS FROM BUOY OR BEACON.	REMARKS.
Lower middle	Red	12	Spar buoy, 20 feet	Turn of Channel buoy, S. by W.	in 6 feet, low-water.
Upper Middle	Red	14	" " "	Lower Middle buoy, S.E. by E. ¼ E.	" 6 " "
Harlow's Rocks	Red	16	" " "	Upper Middle buoy, S. by W.	" 4 " "
	For entering Sandwich Harbor and Monumet River after passing Wing's Neck Light.				
Wing's Neck light	White		House with lantern on top, fixed light.	On East side of entrance to Sandwich.	
Abial's Ledge	Black	1	Spar buoy, 35 feet	Bird Island light, W.S.W.	in 15 feet, low-water.
Wing's Flats	Black	3	" " "	" " W.S.W.	" 10 " "
Tobey's Island	Red	2	" 30 "	Fishing Rock buoy, N.E. by N.	" 8 " "
Cow Rock Ledge	Red	4	" 20 "	Fishing Rock buoy, N.	" 6 " "
Fishing Rock	Red	6	" " "	Tobey's Island buoy, S.W. by S.	" 6 " "
Mashne Flat	Black	5	" " "	Cedar Tree Rock buoy, N.N.E. ¼ E.	" 5 " "
Cedar Tree Rock	Red	8	" " "	Hog Island Flat buoy, N.N.W. ½ W.	" 6 " "
Hog Island Flat	Black	7	" " "	Mashne Flat buoy	" 6 " "
Agawam Point Rock	Red	10	" " "	Sial's Point buoy, N.W. by W. ¾ W.	" 5 " "
Sial's Point	Black	9	" " "	Turn of Channel buoy, N. ¼ E	" 5 " "
Turn of the Channel	Red	12	" " "	Hog Island Flat buoy, S.S.E	" 5 " "
Middle Ground, lower part	Black	11	" " "	Bourne's Flat buoy, S. by W.	" 5 " "
Bourne's Flat	Red	14	" " "	Upper Middle Ground buoy, N.N.E. ¼ E.	" 5 " "
Middle Ground, upper part	Black	13	" " "	Railroad Bridge draw, N.E. ¾ E.	" 5 " "
Thorn Tree Rock	Red	16	" 22 "	Butler's Flat buoy, N. by W. ¾ W.	" 7 " "
Butler's Flat	Black	15	" 20 "	Butler's Point, S. by W.	" 5 " "
Quahaug Flat	Black	17	" " "	Mordecai Flat buoy, N.N.E. ¼ E.	" 5 " "
Mordecai Flat	Red	18	" " "	End of Ryder's Wharf, N.E. by E.	" 5 " "
	Going into Phinney's Passage between Tobey's Island and Cow Rock buoy.				
Phinney's Rock	Red & black hor. stripes		Spar buoy, 20 feet	Cow Rock buoy, N. by W.	in 7 feet water.
	Going into Back River after passing Cow Rock buoy.				
Phinney's Ledge	Red	2	Spar buoy, 20 feet	Fishing Rock buoy, W. by N.	in 5 feet water.
Phinney's Point	Red	4	" 20 "	" " " S.W. by W.	" 5 " "
	Going into Quisset Harbor after passing Woepecket buoy, Wing's and Wood's Hole.				
West Point	Red	2	Spar buoy, 25 feet	Bird Island light, N. by W.	in 11 feet, low-water.
East Point	Black	1	" 20 "	Wing's Neck light, N. by W.	" 8 " "

Going up Buzzard's Bay and into Hog Island Harbor.

NAME OF STATION.	COLOR.	NO.	DESCRIPTION.	BEARINGS FROM BUOY OR BEACON.	REMARKS.
Hamblin's Point	Red	2	Spar buoy, 35 feet	Bird Island light, N. by W.	in 12 feet, low-water.
Great Marsh Ledge	Red	4	" 35 "	" " " N. by W. ¾ W.	" 12 " "
Hog Island Ledge	Red	6	" 35 "	" " " N.N.W.	" 12 " "
Hog Island Point	Red	8	" 20 "	Hog Island Ledge buoy, W. ¼ S.	" 8 " "
Going into Nye's Harbor and Catawmut Harbor.					
Suile Point Ledge	Black	1	Spar buoy, 35 feet	Nye's Point Ledge buoy, S. E.	in 18 feet, low-water.
Nye's Point Ledge	Red	2	" 25 "	Bird Island light, N.W. by W. ¾ W.	" 9 " "
Nye's Flats	Black	3	" 30 "	End of wharf, S.E. by S.	" 10 " "
Going into Redbrook Harbor between Wing's Neck light and Scraggy Neck					
Catawmut Ledge, South part.	Red	2	Spar buoy, 35 feet	Bird Island light, N.W. by W. ¼ W.	in 17 feet, low-water.
Cataumut Ledge, North part.	Red	4	" 35 "	" " " W.N.W. ½ W.	" 17 " "

BLOCK ISLAND.—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 50 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 2 miles of the light. From the shoal, Montauk Point light-house bears S.W. by W ½ W.; Point Judith 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. *Block Island.*

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 steamboat.

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 2 and 3 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 for sailing into Newport.

From the S.E. part of Block Island to Beaver Tail light-house, the course is N. by E. ¾ E., and the distance 19 miles; 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., 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 Dumplings, must be left on your port hand; it stands on the South part of Conanicut Island. This point is called the Beaver's Tail, and is about 2 leagues distant from Point Judith. *Light-house.*

POINT JUDITH LIGHT is a revolving light, 67 feet above the sea, to distinguish it from Beaver Tail light, which 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 Beaver Tail light-house. Point Judith light may be distinguished from Watch Hill light, by the light not wholly disappearing when within 3 leagues of it. High-water 7 27, rise 3 feet. *Point Judith light-house.* *High-water.*

NEWPORT HARBOR.—Conanicut 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 Conanicut 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. High-water 7 44, rise 4 feet. *Newport Harbor.* *Beaver Tail light.* *High-water.*

A sunken rock lies South of Beaver Tail, called Newton Rock, on which it breaks if there be any sea, distant 200 yards from the light-house. S.W. from the Rock, in 50 feet water, is a black and red horizontal striped buoy, Beaver Tail light bearing N. E. The Rock is about midway between the light and the buoy.

The following are the bearings by compass, from Beaver Tail light-house, of several remarkable places, together with the distances, viz.: [Variation, in 1850, about 9° W.]

Block Island (S.E. point)	S.W. by S. ½ S.
Point Judith light	S.W. ¼ S., distant 2 leagues.
Block Island (N.E. point)	S.W. ¾ S., or S.W. by S. nearly.
Whale Reef	W. ¾ S.
Brenton's Rock	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 Dumpling.....N.E. ¾ E.
Kettle Bottom.....N.E.
Newton's Rock.....S., near 200 yards.
N. B. The anchoring place between Newport and Coaster's Harbor, N.E. by E.

Brenton's Reef.

BRENTON'S REEF.—Brenton's Reef extends about one mile S. by W. from the main shore, on the Eastern side of the entrance: some portions of it are bare at low tide, and may at all times be seen breaking, with a little motion of the sea. A buoy has been moored on the extreme S.W. part of the reef, in 5½ fathoms at low spring tides; it is a spar painted red, the top of which is 25 feet above the level of the sea, and may be seen in clear weather from 3 to 4 miles. Point Judith light-house bears from the buoy S.W. by W., distant 9 miles; Beaver Tail light-house, W by N. ½ N., 2 miles; Seaconset Rocks, E. by S., 8 miles, Castle Hill, N. ½ E., one mile. The buoy may be neared on all sides within a cable's length, but vessels should not pass to the Northward of it, unless well acquainted.

There is a light-ship, showing 2 white lights, off Brenton's Reef, having the following bearings, viz.:

Point Judith light-house.....S.W. ½ W.
Beaver Tail light-house.....N.W. ½ N., 1⅝ mile distant.
Buoy on end of Brenton's Reef.....N.E. by E.

Fort Dumpling N. by E., just open with Castle Hill Point; 13 fathoms water at half-tide; bottom fine gray sand, and there is plenty of water between the light-ship and the buoy on the South point of Brenton's Reef.

Newport Harbor.

NEWPORT HARBOR.—Bound into Newport, it is only necessary to give the shores on either side a berth of one-sixth of a mile, as they are very bold. If you draw over 10 feet water, after passing Beaver Tail light, which is a fixed light, 96 feet above the sea, you steer N.E. ¾ E., about 4 miles, for the light on the North point of Goat Island. You can pass within a short distance of the light, and anchor in the harbor to the North of the Long Wharf, in 3½ fathoms.

If you have 10 feet or less, when past Fort Adams, steer S.E. by E. ¼ E. seven-eighths of a mile for the black buoy off the South point of Goat Island, which leave on the port hand. After passing the buoy, steer N. by E. ½ E., one-quarter of a mile, until under the lee of Goat Island, and anchor in 12 feet water.

Lime Rock light.

If night, after passing Fort Adams, steer for the light on Lime Rock, which is a fixed light, elevated 30 feet above mean low-water, and when past Goat Island follow the above directions.

Goat Island light.

GOAT ISLAND, opposite the town of Newport, about 4 miles N.E. from Beaver Tail light, has a light-house on the extreme North end of the breakwater, containing a fixed light, 33 feet above the sea, from which the following bearings have been taken:—Beaver Tail light-house, S.W., distant 4 miles; West shore of Castle Hill, S.W. ¾ S., 2½ miles; South Dumpling Rock, S.W. ¾ W., 1⅝ mile; Conanicut Ferry, W., 2¼ miles; Gull Rock, N.N.W.

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.

Coming from the Eastward, to clear Brenton's Reef, bring Beaver Tail light to bear W.N.W., and steer for it until you see Goat Island light from the deck, which will then bear N.E. ¾ 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 Beaver Tail light bearing S.W. by W., and anchor in 7 to 9 fathoms, good bottom. In coming from the West, after passing Point Judith, on which is a revolving light, steer N.E. by N., until you draw up with Beaver Tail light, to which giving a berth, run for Goat Island light, and anchor as above indicated.

Vessels coming from the Westward through Long Island Sound, bound to Rhode Island, will leave Fisher's Island on the port 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 Beaver Tail light bearing N.E. ¼ N., distant 6 miles; steer for it, leaving it on your port hand: you will then steer for Goat Island light, which bears from Beaver Tail light N.E., distant about 4 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.

Narragansett Bay lies between Conanicut 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 Beaver Tail light to Gay Head, on Martha's Vineyard Island, the course is E.S.E., and the distance 26 miles.

If, after passing Point Judith, as before directed, you wish to proceed towards Providence through the West Passage, your course is N.E., leaving Beaver Tail light on your starboard hand, half a mile distant, when your course will be N. by W., 1½ league, to Dutch Island light, (erected on the South part of the island, showing a fixed light 50 feet above the sea,) which you also leave on your starboard hand, one-quarter of a mile distant, from which you steer N. ½ E., 14 miles, for the light on Warwick Neck, leaving it on the port 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 Conanicut Island, to avoid the Whale Rock, which bears from Beaver Tail light S. 82° 30′ W., distant about three-fourths of a mile, with some scattering rocks North and South of it.

Warwick Neck light-house is erected on the South part of Warwick Neck, and shows a fixed light, 54 feet above the sea. A spar buoy has been placed on Long Island Point, off Warwick Harbor, 1½ mile distant, which must be left on the port hand going into East Greenwich. *Light-house*

BUOYS AND SPINDLES PLACED AT NEWPORT HARBOR.—A spindle on Saddle Rock S.E., Eastward of Rose Island, on either side of which there is a passage. *Buoys and Spindles.*

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 black 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.

A spindle on the Half-way Rock, which you can pass on either side.

PRUDENCE ISLAND.—A light on Sandy Point, East side of Prudence Island, fixed, 30 feet above the sea. A black buoy on the S.E. part of the shoal off Hog Island, which you leave on the port hand going in. *Prudence Island.*

A beacon on the North end of Rhode Island, South of Bristol Neck, which you leave on the starboard hand going in.

At Plum Beach a can buoy painted black, in 14 feet at low-tide, bears from Dutch Island light E. by N. Vessels bound up the bay must leave it on the port hand, and give a berth of one cable's length, and continue the course up the bay.

Brig Ledge, off Wickford, a spar buoy painted black and white perpendicular stripes, in 10 feet at low-water.

Manna Rock, a spar buoy painted red. The above buoy bears from Poplar Point light-house E. by N. ½ N. These buoys are in a range, and the channel varying; no proper directions can be given.

A dolphin has been placed on Long Bed, in Providence River, in lieu of the buoy formerly placed there.

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. *Newport to Providence.*

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 port 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 port 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 on the port hand. At a short distance you come to another pyramid and a stake, both of which you leave on your port 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 *Bristol Harbor.*

it, which is left on the starboard hand, and a red spar on the port, steering N.E. when entering.

Beaver Tail light and through the Sound.

BEAVER TAIL LIGHT AND THROUGH THE SOUND.—The first course from the light-house on Beaver Tail 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. ¾ 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 port hand.

Watch Hill light is situated on Watch Hill, at the entrance of Fisher's Island Sound. The light is fixed, 62 feet above mean low-water.

Stonington light-house.

STONINGTON LIGHT-HOUSE shows a fixed light, 50 feet above the sea, on the extreme point of land at Stonington, and bears from Watch Hill Point light-house N. W. ¼ W., 2½ miles distant; from Napatree Point, on which there is a red can buoy, No. 4, N.N.W. ¼ W., 1½ mile; from Catumbsett Rock spindle, N., 2 miles; Wicopesset, N. by E. ½ E., 2 miles; Latimer's Reef, on which there is a black and red striped buoy, N.E. ½ E., 1¾ mile, Wamphasgett Shoal, on which there is a red spar buoy, No. 6, E. by N. ½ N., three-fourths of a mile; North Dumpling, E. by N. ¼ N., 5½ miles distant. High-water 9h. 5m., rise 3 feet.

High-water.

Stonington Harbor and Fisher's Island light-house.

STONINGTON HARBOR AND FISHER'S ISLAND.—If off the South-east part of Fisher's Island, bring the highest steeple in 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 Wicopesset Ledge spindle 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 red and black striped buoy on Latimer's Reef on your starboard hand, about 150 yards off, until Morgan's Point light bears N.N.E. ½ N., when a W. by S. course will lead you in a fair way for the Sound. In steering the last course, you will pass Eel Grass Shoal and Ram Island Reef on your starboard hand, and Seal Rocks, Young's Rock, East Middle, and West Clumps on your port hand. If you wish to go through the Southern Channel, you will, on passing Latimer's Reef, continue on your W. ¾ N. course, 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 Dumplings, which are two small islets of moderate height. You are then clear of all danger, and in a fair way for the Sound. The North Dumpling is bold to, except on the East side. There is on it a fixed light, 70 feet above the sea.

Lights.

Young's Rock.

YOUNG'S ROCK, which just washes, lies South of Latimer's Reef. Blake's Rock, 4 feet water, a short distance East of Latimer's Reef buoy.

South of the Dumplings 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. Ram Island Reef, on which is a spindle, lies South of the house on Ram Island, distant about one-third of a mile; there is a very narrow passage between of 5 fathoms water. Potter's Reef lies N.W. ½ W. from the North Dumpling, distant one mile. Between them there is a fine passage, free from all danger; this reef is of a small extent, and has on it a spindle which may be passed, with a berth 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, on which there is a red spar buoy, No. 18, lies West of Groton Long Point, and N.E. of Potter's Reef: 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, one-third of a mile off shore.

After you have passed Fisher's Island Sound, you should be careful to keep the South Dumpling 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 not go to the Southward of the South Dumpling, but should, after passing either between the Dumplings, or North of

them, bring Morgan's Point light to bear N.N.E. ½ N., and steer E. ¾ S., until the Breakwater 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 on Ram Island N.W., steer E. ¾ S. for Watch Hill light, leaving Latimer's Reef on your port hand, and giving Napatree Point and Watch Hill Point a berth of one-third of a mile, leaving Watch Hill Reef, on the East end of which is a spar buoy, on your starboard hand. This buoy 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.

High-water 9h. 5m., rise 3 feet. *High-water.*

The spindles on Ellis', Turner's, Watch Hill, and Latimer's Reef, having been carried away by the ice, the positions of the three first have been marked by spar buoys. On Latimer's Reef is placed a can buoy painted black and red horizontal stripes. *Marks changed.*

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 lie South of the White Rock, which is E.N.E. from Ram Island, half-way to the light-house on Stonington Point, and is always conspicuous; but you are clear of them when Stonington light bears E.N.E. On them is a light-vessel and a red spar buoy, No. 10. *Eel-grass Shoals.*

A spar buoy, painted black, is moored on the Middle Ground of the harbor of Stonington, in 12 feet water at low-tide, and Stonington light-house S. by W., one mile distant. Vessels bound into Stonington Harbor, of a larger draft than 12 feet, must give the buoy a berth of one-fourth of a mile on the starboard hand, and steer N. by E. for the light-house. East end of Fisher's Island from the buoy S.W. by S. ½ S., distant 2 miles; Napatree Point, S.E. by S., 1 mile. *Spar buoy.*

Off the S.E. part of Bartlett's Reef there is a light vessel painted black, with white stripes on her bulwarks, and showing 2 lights, 28 and 35 feet above the sea. A spar buoy painted black is also moored upon it in 9 feet water, Stonington light-house bearing S. by E., one-quarter of a mile distant. Vessels bound to Pawcatuck River must leave this buoy on the starboard hand. *Bartlett's Reef light-vessel.*

At Folly Rocks (mouth of Pawcatuck River) is an iron spindle with a keg upon the top. It bears from Stonington light-house E. by S. *Folly Rocks spindle.*

Race Rock buoy is a spar painted black with a red top, the top of which is 15 feet above the level of the sea. It is moored in 2½ fathoms at low-tides, and bears from the light-house on Watch Hill South, one-quarter of a mile. *Race Rock buoy.*

Watch Hill Reef buoy is a spar, painted black, moored E. from the reef about one cable's length, in 21 feet of water at low-tides, the top of which is elevated 20 feet above the level of the sea, and may be seen in clear weather 3 miles. This buoy bears from the Watch Hill light-house, S. by W. ¾ W., 1¼ mile. *Watch Hill Reef buoy.*

Napatree Point buoy is a spar painted red, with a white top, which is elevated 12 feet above the sea, moored in 21 feet of water at low tides, and bears from Watch Hill light-house W. by N., 2½ miles. Napatree Point bears from the buoy N. by E. ¾ E., one-quarter of a mile. Watch Hill Reef buoy bears E.S.E., about 2 miles distant; depth of water between Race Rock buoy and Watch Hill Reef buoy 6, 5, and 4, fathoms, and 3 fathoms may be found within one cable's length of either buoy. Vessels from the Eastward who intend going through Fisher's Sound, should leave Race Rock buoy on the starboard hand, and Watch Hill Reef buoy on the port hand; after passing them follow the directions. *Napatree Point buoy.*

LONG ISLAND SOUND.—[Magnetic variation, in 1850, Western part, 6° W.; Eastern part, 8° 20′ W.]—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 74 feet above the level of the sea, and contains a fixed light. High-water 9h. 38m., rise 2 feet 9 inches. *Little Gull light.* *High-water.*

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 half a mile from the point of the island, 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. for Faulkner's Island light, elevated 98 feet above the level of the sea, which exhibits a fixed light, distant 8 leagues, on which course you should be careful to avoid the Long Sand Shoal, off Cornfield Point, which extends East and West 5 miles. Off Cornfield Point there is a light-vessel to mark this shoal. She is sloop-rigged, and has a square cage-work day-mark, and is moored in 7½ fathoms, sand bottom, Cornfield Point bearing N. *Faulkner's Island light.* *Cornfield Point light-ship.*

and Faulkner's Island light S.E. by E. ¾ E. 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 Faulkner'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, on the South end of which there is a light-ship.

Middle Ground light-ship.

Old Field Point light.

The light-house on Old Field Point shows a fixed light, elevated 67 feet above the sea. It bears from Eaton's Neck light E., 12¾ miles distant; from Stratford light, S. 9° W., 10¾ miles distant; from Black Rock light, S. ½ E., 11 miles distant; from New Haven light, S.W. ½ S., 18¾ miles distant.

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 Lloyd'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 port hand, from whence you may steer S. 66° W., which will take you between Sands Point and Execution Rocks lights, on the latter of which, on the East end, are two spar buoys, red and black horizontal stripes, one on East and one on West end, both in 18 feet water. Off Sands' Point is a black spar buoy, No. 9, in 21 feet water. If, when up with Faulkner's 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 Sands' Point light-house,

Execution Rocks buoy.

Sands' Point buoy.

Eaton's Neck light.

Eaton's Neck light-house, fronting from the East round North to the South-west, is elevated 138 feet above the level of the sea, and shows 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. High-water 11h. 1m., rise 9 feet 2 inches.

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.

Sand's Point light-house is N. 42° 30′ E. from Throg's Point light, distant 4 miles and six-tenths; it is 53 feet above the level of the sea, and is revolving, showing a flash once in 30 seconds. The rocks extend from the shore opposite the light N.W., one eighth of a mile. High-water 11h. 12m., rise 8 feet 7 inches.

Stratford light.

Stratford light-house contains a revolving light, 53 feet above the sea. The revolution is such as to exhibit the light once in 70 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. 5° W., 5½ miles distant; Black Rock light, W.

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 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 daytime, 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, towards 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, Faulkner's Island, and New Haven lights on your starboard hand, Plum Island light on your port hand, and will pass 3 miles South of Faulkner's Island, in 17 fathoms water. When up with Stratford light, and it bears North, 1½ mile distant, your course to Sands' 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.

Plum Island light.

Plum Island light is a revolving light, 63 feet above the level of the sea, on the W. point of the island.

Faulkner's Island light is fixed, varied by flashes, 98 feet above the sea.

Kimberly's Reef.

KIMBERLY'S REEF, on which there are 13 feet water, bears E. ¼ N. from Faulkner's Island light, distant 1¼ mile.

Should you wish to anchor under Faulkner's Island, there is good holding-ground on the East and 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 Faulkner'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. ½ E. from Faulkner's Island, distant 5½ miles. When standing to the South towards Goose Island, you should be careful of the shoal extending to the North of it, and you are just clear of it when Faulkner'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 Wheaton'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 spindle bearing from Faulkner's Island light W. ¾ N., distant 6¾ miles, and from New Haven light, S.E. by E. ¾ E., distant 4¾ 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, 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 Wheaton'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 port hand, and Thimble Buoy to the West of the Thimble, half a mile, and the buoy on the Negro Heads, on your starboard hand; this range takes you within 100 yards of the Negro Head Buoy, and about seven-eighths of a mile North of Branford Reef, when you may steer W. by S. ½ S. for Stratford Point. Goose Island is W.S.W. from Faulkner'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.

Wheaton's Brown's, and Branford's Reefs.

Thimble buoy.

Negro Head buoy.

S. ½ W. from Stratford light, distant 5½ miles, is the Middle Ground, which bears from Eaton's Neck light E. by N. ¾ N., 14¾ miles; from Black Rock light, S.E. ½ S., 7 miles; and from Old Field Point light, N. by E. ¼ E., distant 5 miles. On this shoal are 2 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.

Middle Ground light-ship

Stratford Point light-vessel is on the Middle Ground. It is straw-colored, and shows two lights, at 32 and 40 feet above the sea, Block Island light bearing N.W. ¾ N.; Stratford Point light, N. ½ E.

Stratford Point light-vessel.

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.

Black Rock light is on Fairweather Island, at the entrance of Black Rock Harbor, it is a fixed light 52 feet above the sea. High-water 11 hours 1 minute; rise 9 feet 1 inch.

Black Rock light.

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 Cockenoe's Island, E. by S., 1½ mile, and on which there is a buoy, red and black horizontal stripes. When Goose Island, which is the first island S.W. from Cockenoe's, 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, 1¼ mile W. by S. ½ S. from Norwalk light. W. by S. from Norwalk light, 2¾ 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 S.W. by 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 Islands lies S.W. by W. ¾ 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, 62 feet above the sea, bearing from Norwalk light

Cockenoe's Island.

Cows Reef.

Captain's Islands.

Light-house.

W. by S. ½ S., distant 10¼ miles; from Eaton's Neck light, W. by N. ¼ N., 10½ miles; and from Sands' Point light, N.E. ½ N., 8½ 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. High-water 11 hours 1 minute, rise 8 feet 2 inches.

On the South shore of the Sound, after passing Eaton's Point to the Westward, is Lloyd's Neck, the North point of which is low and sandy. East from which is a reef on which 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

Oyster Bay. the West of Lloyd'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.

Pulpit Rock. One mile East of Sands' 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 Sands' 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 Gangway Rocks, on both of which are buoys, left on the port hand on the above course, although you may go on either side

Success Rock. of them. Success Rock is bare at low-water, and is S.W. from the light-house on Sands Point about one mile. Gangway Rock has 6 feet of water on it, and is one-sixth of a mile

Gangway Rock. W.N.W. from Success Rock, lying (as its name imports) in mid-channel. The South point of Hart Island has 2 single trees on it, and is bold to. The course from this to Throg's Point light-house (which stands on the S.E. point of Throg's Neck, and contains a fixed light, 66 feet above the sea) is S.S.W. ¼ W., on which course you will leave the buoy on the Stepping Stones on your port hand, and you may stand over to the Westward, guiding 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

Old Ferry Point. point on your port 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 port 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.

Execution Rocks light. EXECUTION ROCKS LIGHT is a white fixed light, 54 feet above the sea. It bears from Sand's Point light N.N.W., distant seven-eighths of a mile; from Throg's Point light, N.E. by N., 5 miles.

The rocks extend one mile in a N.N.E. and S.S.W. direction, and are one-quarter of a mile wide in the broadest part, where the light-house is placed, near the middle of the reef.

Buoy. There is a spar buoy with red and black horizontal stripes on the N.E. point of the reef, in 18 feet water, and a similar one on the S.E. part, in 18 feet. High-watre 11h. 12m., rise 8½ feet.

Throg's Point. THROG'S POINT.—At Throg's Point it is high-water, full and change, at 10h. 59m., rise 7½ feet.

Hell Gate. HELL GATE.—It is high-water, full and change, at 10h. 4m.

Hart Island. 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. HUNTINGTON BAY has a fair entrance and good 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. High-water 11h. 1m., rise 9½ feet.

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. *Shoals in the Sound.*

Hatchett's Reef, to the East of Connecticut River; it bears E. by S. from Saybrook light-house, and S.S.W. from Hatchett's Point, and is dangerous. Between this reef and the shore is Burrows' 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 mile from the shore. *Pilots.*

To the S.W. of Horton's Point, which is on the Long Island side, and S.E. from Faulkner'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; at this point you should not come nearer to the shore than two miles until you are West of Wading River, on account of a shoal off the Friar's Head and Herod'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.

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.

SAILING 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. High-water 11h. 2m., rise 6 feet 6 inches. *Sailing directions.*

MONTAUK POINT LIGHT is on the East end of Long Island, bearing W. by S. ½ S. from the S.W. point of Block Island, 4 leagues distant; from Montauk light-house to the West point of Fisher's Island, N.W. by N. ½ N., 13½ miles distant. The light-house contains a fixed light, elevated 160 feet above the level of the sea. High-water 8h. 15m., rise 2½ feet. This light will be altered, during the present year, to a first-class Fresnel light, 225 feet above the sea. *Montauk Point light.*

BLOCK ISLAND TO GARDNER'S BAY.—Montauk Point, the Easternmost part of Long Island, is 4 leagues W. by S. ½ 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. *Block Island to Gardner's Bay.*

Between Montauk 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 Montauk and the S.W. part of the island, W. by S. from the latter, and about E. ¾ N. from the light-house on Montauk, distant 8¼ 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 Montauk light bearing W. ¾ S., 8 miles distant, you will have 5½ fathoms. The soundings from the shoal towards Montauk 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. *Shoal.*

In rounding Montauk, come no nearer than 9 fathoms, or keep the two bluffs, or high parts of the land, (to the Westward of Montauk,) open one of the other, until Willis' Point comes open of Montauk 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 Montauk 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 Montauk False Point. The tide sets strong round Montauk Point; the flood N.E. and ebb to the contrary. At the Shagawanock the flood sets W. by S. and ebb to the contrary. The following bearings were taken when on the Shagawanock, in 6 feet:

Shagawanock Reef.

Tide.

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. Montauk 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. Montauk False Point is 2 miles N.W. from the light-house. Willis' Point is the Eastern-most point of Fort Pond Bay.

In rounding Montauk 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 sand. Having brought Montauk 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 in 12 or 13 fathoms, before you attempt to steer to the Westward, after having sounded in 6 or 7 fathoms. In the day-time, having rounded Montauk, 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 Shoal.

Light-house. On the North point of Gardner's Island there is a fixed light, 29 feet above the sea.

Middle Ground, or Cerberus Shoal. 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, 11, 9, 8, 7, to 5 fathoms, sandy bottom. It lies N.W. ½ N., 7½ miles, from Montauk light-house; E.S.E. ½ S., 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.

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 a 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.

Race Rock spindle.

Reef. About 3 miles within Montauk 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 Montauk light, is a small fishing-bank, having 8, 9, 11, and 15 fathoms on it, before mentioned.

High-water. In the offing, between Montauk and Block Island, it is high-water at half-past 9, full and change.

Montauk 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. The 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

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 10 miles W.N.W. ¼ W. from Montauk 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 Plum 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.

Gardner's Bay.

The entrance of Gardner's Bay is formed by the North end of Gardner's Island and the South end of Plum Island. If you are bound through the Sound towards New York, your passage from Gardner's Bay is between the West end of Plum Island and Oysterpond, 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, which is a single black rock between Plum Island and Great Gull, and called "Old Silas," as there is a rocky spot 1½ 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 Plum Island (standing about one-third of the way between the middle and the N.E. end) on with the Northernmost of the two trees which appear beyond the house; the North end of Plum Island to bear N.N.W., or N. by W. ½ W., and the Southernmost end of Plum Island on with the Northernmost point of Long Island. In order to avoid this rock, when going into, or coming out of, Gardner's Bay, you must be sure to keep the South point of Plum Island open of the N.W. point of Long Island, whilst the house on Plum 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. E. by N., one league from Plum 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.

Old Silas rock.

Bedford Rock.

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 S.W. side, you must give the N.W. 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 N.W. 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 S.E. part of Plum Island, and tacking before it is brought to touch the South end of the wood on Plum 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 N.W. end, 4, 4½, and 5 fathoms close to the S.E. 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 Plum Gut a ship's breadth open. Stand to the Northward until Plum Gut is nearly closing on the N.E. bluff of Long Island, nearly touching the S.E. point of Plum Island, and until New London light-house is brought to the North and West of 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 Plum 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. High-water at the Gull 11h. 30m., full and change.

High-water.

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 Dumpling 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 Montauk 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 port hand.

Tide. The first half-flood sets N.W., the last half about W.N.W., and the ebb E.S.E.

The above is to be observed in case the weather should be thick, and New London church spire not to be seen, or when 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 9h. 38m., full and change days of the moon; but in New London roads only 9h. 30m. It rises 2¾ 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 S.W. 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 S. by W.: 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 4 knots. High-water, full and change, at 9h. 38m. The first half flood sets N.W., the last half about W.N.W.; consequently, upon steering 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, often carries them on Race Point, from which runs out far off a reef of rocks under water.

To go through Plum 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 Plum 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 Oysterpond Point. Steering with the wood and this point in one, will carry you clear of the reef, which lies off the North bluff.

Pine Point.

Oysterpond Point.

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.

Tide. The tide runs 4 or 5 knots in the Gut. The flood sets about N.N.W., and the ebb S.S.E. It is high-water at 9h. 38m., full and change.

Marks for the Valiant 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 Dumpling 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 Plum 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 Plum Island touching the South declining end of the Southernmost of the white sand-hills on Plum 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 Plum Island, N.W. by N.

Appearance of 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 Plum 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; 3 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 2 chimneys, in the bay, East side of Plum 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 Plum Island, S. 74° W., and the N.E. end of same, N. 45° E.

Marks for a shoal in the middle of Plum 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 gray cliff on Gardner's Island, S.E. by E.
3. Oysterpond Point, W. ½ N.; the S.E. (or Pine Point) of Plum Island, E. by N., and the rocky point or bluff point of Plum Island, North. The passage through Plum 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 Plum Island, on the latter of which is a revolving light.

Marks for anchoring in Plum Island Roads.

Mount Prospect, or the white sand-hills of Fisher's Island, touching the Gull light-house, N.E., and the N.E. part of Long Island in one with the S.E. end of Plum 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 Plum 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 4¼ fathoms at low-water, and breaks with a heavy sea. As you open the passage between Montauk 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 Montauk Point.

The S.E. part of Block Island bears E. by N. from the light-house on Montauk Point, 15 miles distant.

The Eastern rips lie E.N.E., 5 miles from the light-house. The Northern rips lie N. N.E., 1¼ mile from the light-house. These rips, although they may appear to the mariner dangerous, may be crossed with any draught, in 6, 7, 8, and 9 fathoms.

Shagawanock Reef, on which a black buoy is placed, bears N.W. ½ N. from the light-house on Montauk Point, 4 miles distant; the reef ranges N. by W. and S. by E., about one-half 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 Montauk.

The East end of Fisher's Island bears N. ¼ W. from the light-house on Montauk Point, 13½ miles.

Watch Hill Point light-house (which contains a repeating light) bears N. ¾ E. from Montauk 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 spindle placed, bearing S.W. by W., half a mile from the West point of Fisher's Island, bears from Montauk light-house N.W. by N. ¼ 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 spindle 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, 4 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., 4½ miles distant from the Race Rock.

Little Goshen Reef, where a buoy is placed, bears E.N.E., 1¾ mile 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 1¾ mile distant, and contains a fixed light.

The S.W. Ledge, New London Harbor, where a buoy, black and red horizontal stripes, is placed, bears N. by W. from the Race Rock, 4¼ miles distant.

The East Chop of New London Harbor, bears N. by E. ¼ E. from the S.W. ledge, three-fourths of a mile distant.

The light-house bears from the buoy on S.W. ledge N.W. by N. one mile distant.

Race Rock. RACE ROCK, which has but 4 feet water on it at low-tide, lies half a mile S.W. of Race Point, the S.W. extremity of Fisher's Island, and has on it an iron spindle, to the S.E. of which, in 17 feet water, is a red and black striped spar buoy.

Valiant Rock. VALIANT ROCK, lies about S.W. ½ W. from Race Rock, 1½ mile distant, and has on it 17 feet at low-water. On the S.W. part of the reef, in 18 feet water, is a nun buoy, with red and black horizontal stripes. This reef is about midway between Race Rock and Gull Island light.

Gardner's Island to Shelter Island. GARDNER'S ISLAND TO SHELTER ISLAND.—If you fall in with Gardner's Island, you must sail on the North side of it till you come up with a low sandy point at the W. end, which puts off 2 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. GARDNER'S ISLAND TO NEW LONDON.—Your course from the East end of Gardner's Island to New London is N. ¼ E., about 4 leagues, to the buoy on Sarah's Ledge, West side of the entrance to New London Harbor; then steer as directed below. This course will lead you through the Race, to the Eastward of Gull Island light and Westward of Valiant Rock, 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.

New London light-house. High-water. NEW LONDON LIGHT-HOUSE stands at the entrance of the harbor, on the Western side. The lantern is elevated 86 feet above the level of the sea, contains a fixed light, and bears N. by E. from Little Gull light, about 6½ miles. High-water 9h 30m., rise 2½ feet.

New London. 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 port 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.W. by W. ½ W., and steer S.S.W. ¼ S. 2¼ miles, or until the light bears N. by E., when a W. by S. course will be in a fair way for the sound.

Niantic Harbor. NIANTIC HARBOR.—This is one of the best harbors of refuge on the Northern shore of Long Island Sound with the wind anything between West and East by the way of North. To run in when you are between Bartlett's Reef and Black Point run for a small island called on the chart White Rock, which is bold. You can pass it on either side, and anchor to the North of it in 3½ fathoms.

The bottom between Bartlett's Reef and Black Point is soft, which is a good mark when running for an anchorage in thick weather, as off the reef and the point the bottom is hard. *High-water.* High-water at 9h. 30m.

In coming in, or going out of New London, (when opposite the Gull light,) bring the Gull light to bear S.S.W. ¾ S., and New London light, N.N.E. ¾ E.; leave the light on your port hand in going into the harbor; keep well to the W. if it be winter, and

the 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 W.N.W., until you get into 10 fathoms of water, muddy bottom; anchor as soon as possible—you will be between Hatchet'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 Point light.

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 from the sea 80 feet.

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 distant, 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 3 or 4 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 a black spar buoy on the North, between which you cannot go, bears North from Satauket (Long Island) and S. 3° W. from Stratford Point light. The buoys are placed in 19 feet water. In leaving Faulkner's Island light North 2 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 your port hand; then your course is W. S.W. to Matinicock Point.

From Plum Gut to Greenport.

FROM PLUM GUT TO GREENPORT.—Vessels bound to Greenport may make their course S.W., and run three 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 Plum 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 carry you to Hay Beach Point, on Shelter Island, which you leave on your port 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.

FROM GARDNER'S POINT TO GREENPORT the distance is 12 miles, and your course is W. by S. Running this course you will shoalen 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.

Oysterpond Point and Plum Island.

OYSTERPOND POINT AND PLUM ISLAND.—In sailing through this passage, (called Plum Gut,) you leave the light on the West point of Plum Island, which is a revolving light, 63 feet above the sea, on your port 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 Oysterpond Point on your starboard hand, off the Eastern part of which a shoal extends one-third over towards the South end of Plum Island.

Bearings.

The bearings of the light-house have been taken from the following places:—From Oysterpond Point and the reef, N.E. by E., distant from the outer part of the reef one mile; from Saybrook light, S.E. ½ S., distant 8 miles; from Pine Point, the S.W. part of Plum Island, N.W. by N., distant three-quarters of a mile; from Cherry Harbor Point, the S.W. part of Gardner's Island, N.N.W., distant 6 miles; from Gardner's Point, N.W., distant 3½ miles; from New London light, S.W. ¼ S., distant 10 miles; from Cedar Island (at the entrance of Sag Harbor) N.N.E. ¼ E., distant 8 miles.

Light-house.

On Cedar Island is a fixed light; it is elevated 34 feet above the sea, 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. by E. ¼ E., distant 2¼ miles; Plum Island light-house, S.S.W. ¼ W., 8 miles; Gull Island light-house, S.W. ⅛ S., 12 miles; sandy point of Gardner's Island, S.W. ¼ W., 7½ miles.

New Haven light-house. 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 93 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.W. by W. ¾ W., 10½ miles ; Middle Ground, S.W., 14 miles ; buoy on Adams' Falls, S.W. ; buoy on S.W. Ledge, S. 30° W. ; beacon on Quick's Ledge, S. 1° E. ; Faulkner's Island light, S.E. by E. ½ E., 12 miles.

If bound into New Haven, give Faulkner'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 one 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 Palisades, 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, on which there is a small fixed red light, 21 feet above the sea, 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 in between the buoy on the Southwest Ledge and the Spindle, as there are 3 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 2 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 agoing often, on account of bordering on the West shore, where you will have hard bottom, and soon aground. High water 11h. 16m., rise 6 feet 6 inches.

High-water.

Bridgeport. BRIDGEPORT.—Vessels bound into Bridgeport must leave the outer buoy on the port 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 port.

Light. Bridgeport light is a fixed red light, 23 feet high.

In the Harbor of Bridgeport are 3 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. High-water 11h. 11m., rise 8 feet 8 inches.

High-water.

Black Rock light. BLACK ROCK LIGHT is on Fairweather Island, East side of the entrance to Black Rock Harbor, and is a fixed light, 52 feet above the sea.

Fairweather Island. 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 2 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 2 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 2 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.

Between Fairweather Island and the entrance of Bridgeport Harbor there is good anchorage, in from 2½ to 4 fathoms, sticky bottom, with the wind from E.N.E. to S.W., by way of North. Bring the woods on the West of the harbor to bear N.E., and anchor in such depth of water as you wish.

Beacons and Buoys as they are passed in sailing through Main Ship-channel, Long Island Sound, from Montauk light to East River.

NAME OF STATION.	NO.	DESCRIPTION.	DEPTH OF WATER AT BUOY OR BEACON.
Shagwang Reef		Bell buoy-boat, black	33 feet, low-water.
Middle Ground, or Cerberus Shoal		Can buoy, red & black hor. stripes	18 " "
Race Point	2	Spar buoy, red	15 " "
Race Rock		Spar buoy, red & black hor. stripes	17 " "
Valiant Rock		Nun buoy, red & black hor. stripes	18 " "
Little Gull Island	1	Spar buoy, black	16 " "
Bartlett's Reef		Light-vessel, black with white streak	10 fathoms.
Black Boy Reef	4	Spar buoy, red	14 feet, low-water.
Hatchet's Reef	6	" "	15 " "
Saybrook Flats	8	" "	18 " "
Long Sand Shoal, East end		Spar buoy, red & black hor. stripes	16 " "
Orient Shoal	3	Spar buoy, black	18 " "
Cornfield Point	6	" red	15 " "
" "		Light-vessel, red	7½ fathoms.
Hen and Chickens	8	Spar buoy, red	16 feet, low-water.
Crane Reef	10	" "	14 " "
Long Sand Shoal, West end		Spar buoy, red & black hor. stripes	16 " "
Kimberly's Reef		Spar buoy, red & black hor. stripes	11 "
Friar's Head Shoal	5	Spar buoy, black	15 " "
Branford Reef beacon		Gray granite black day mark	dry.
Herod's Point	7	Spar buoy, black	15 feet "
Pond Point	12	" red	21 " "
Mount Misery Shoal		Spar buoy, red & black hor. stripes	14 " "
Stratford Shoals light-vessel		Yellow, two cage-work day marks	11 fathoms "
Stratford Point	14	Spar buoy, red	11 feet "
Black Rock beacon		Black iron pile, cage on top	dry.
Penfield Reef	16	Can buoy, with staff, red.	14 feet "
Cockend Reef	18	Spar buoy, red	14 " "
Eaton's Neck	11	" black	21 " "

Beacons and Buoys as they are passed in sailing through Main Ship-Channel, Long Island Sound, from Montauk Point to East River.

NAME OF STATION.	NO.	DESCRIPTION.	DEPTH OF WATER AT BUOY OR BEACON.
Lloyd's Point	13	Spar buoy, black.	16 feet, low-water.
Green's Reef	20	" red	15 " "
Smith's Ledge	22	" red	dry at half-tide.
Shippan Point	24	" red	dry.
Centre Island	15	" black	20 feet, low-water.
Matinicock Point	17	" black	18 " "
Glover's Reef		" red & bl'k h. stripes.	dry.
Execution Rocks, Eastern buoy		" "	18 feet, low-water.
Sands' Point	19	" black	21 " "
Execution Rocks, Western buoy		" red & bl'k h. stripes.	18 " "
Gangway Rock	21	" black	20 " "
City Island	26	" red	15 " "
Stepping Stones	23	" black	18 " "

Through Fisher's Island Sound from the Eastward.

Gangway Rock	2	Spar buoy, red	21 feet, low-water.
Watch Hill Reef	1	" black	21 " "
Watch Hill spindle		¼ keg on top, black	dry.
Westward & Southward of Watch Hill Reef		Spar buoy, black & white perpendicular stripes	40 feet, "
Sugar Reef beacon		Black iron pile, cage and ball on top (building.)	
Napatree Point	4	Iron can buoy, red	21 " "
Sugar Reef spindle		¼ keg on top, black	4 " "
Middle Ground	6	Spar buoy, red	12 " "
Catumb Reef spindle		Keg on top, "	
Channel between Wicopesset and East point		Spar buoy, red & b'lk h. stripes.	14 " "
Eastward of Latimer's Reef.		" " "	15 " "
Northw'd of " "		" " "	
Wampasset Reef	8	" red	12 " "
Seal Rocks		Spar buoy. black	15 " "
Latimer's Reef spindle		Keg on top, black.	
Red Reef	10	Spar buoy, red	15 " "
Young's Rock	3	" black	15 " "
Eel Grass Shoal light-vessel		Lead color, one fixed white light	
W. end of Eel Grass Shoal.	12	Spar buoy, red	14 " "
East Clump	5	" black	18 " "
Ellis's Reef	14	" red	11 " "
" " spindle		Keg on top, black.	
Middle Clump	7	Spar buoy, black	17 " "
Sweeper's Ground	16	" red	12 " "
Groton Long Point beacon.		Iron pile, red, cage-work cone on top	17 " "
Horse-shoe Reef	18	" "	24 " "
Sea-flower Reef		" red & bl'k h. stripes.	10 " "
Sea-flower Reef beacon		Iron pile, black, cage on top (building.)	
North Hill	9	" black.	
Black Ledge beacon		Iron pile, black, 2 conical cages on top.	
Black Ledge. } These 3 buoys mark the entrance to New London Harb.	2	Can buoy, red	18 " "
Mercer's Rock		" red & bl'k h. stripes.	12 " "
Rapid Rock..		Spar buoy, " " "	12 " "

Going through the East Channel into Mystic Harbor.

NAME OF STATION.	NO.	DESCRIPTION.	DEPTH OF WATER AT BUOY OR BEACON.
Whale Rock spindle		Iron spindle, ½ barrel on top, bl'k	
North of Whale Rock	1	Spar buoy, black	11 feet, low-water.
North Point, Ram Island	3	" "	18 " "
Ram Island Flats	5	" "	10 " "
Crook's Spindle		Iron spindle, keg on top, black	

Going through West Channel, Mystic Harbor.

Groton Long Point beacon		Iron pile, red conical cage on top	
First buoy East of Groton Long Point		Spar buoy, bl'k & white p. stripes	11 " "
Second buoy E. of Groton Long Point		" " "	12 " "
Third buoy East of Groton Long Point		" " "	11 " "
Spindle on the Whale		Black iron spindle, keg on top.	
East of Whale Rock	2	Spar buoy, red	10 " "
Crook's spindle		Iron spindle, ¼ keg on top, bl'k.	

Going through East Channel, New London Harbor.

Pine Island	2	Spar buoy, red	18 feet, low water.
North East point of Black Ledge	1	" black	12 " "
Frank's Ledge		" red & bl'k h stripes.	13 " "
Melton's Ledge	7	" black	9 " "

Going through West Channel, New London Harbor.

Bartlett's Reef light-ship.		Bl'k, with white stripes on bulw's	10 fathoms.
Rapid Rocks		Spar buoy, red & bl'k h. stripes.	12 feet, low-water.
Little Goshen Reef	1	" black	14 " "
Goshen Reef	3	" "	16 " "
Mercer's Rock		Can buoy, red & bl'k hor. stripes	5 fathoms.
Cormorant Rocks	5	Spar buoy, black	13 feet, low-water.
S.W. point of Black Ledge.	2	" red	18 " "
Black Ledge beacon		Iron pile, two conical cages on top, black.	
S.W. Ledge		Spar buoy, red & bl'k h. stripes.	16 " "
Frank's Ledge	7	" " "	13 " "
Melton's Ledge		" black	9 " "

Going through the Channel North of Two-Tree Island from the Eastward.

Rapid Rocks		Spar buoy, red & bl'k h. stripes.	12 feet, low-water.
Bartlett's Reef light-vessel.		Bl'k, with white stripes on bulw's.	10 fathoms.
Little Goshen Reef	1	Spar buoy, black	14 feet, low-water.
N. point of Bartlett's Reef.	1	" "	12 " "
Two-Tree Island	3	" "	18 " "
Millstone Point	2	" red	18 " "
Little Rock	4	" "	15 " "
Pond Reef	5	" black	14 " "

Going through the Channel inside of Hatchet's Reef from Eastward

North Hatchet's Reef	1	Spar buoy, black	12 feet, low-water.
Griswold's Rock	2	" red	12 " "

Beacons and Buoys as they are passed in entering Connecticut River.

Saybrook beacon		White stone beacon.	
Calve's Island beacon light.		Iron pile, lantern on top, black.	
Hayden's Reef	1	" black	8 feet, low-water.
South end of Pequot Reef.	3	" black	10 " "
Brockway's Reach beacon		" lantern on top, white.	
South end of Mud Island	2	" red	12 " "
Devils Wharf beacon		" lantern on top, white.	
Chester Rocks	4	" "	8 " "
Sear's Shoal		" bl'k & white p. stripes	8 " "

Going into Killingworth Harbor.

NAME OF STATION.	NO.	DESCRIPTION.	DEPTH OF WATER AT BUOY OR BEACON.
Stony Island Reef	2	Spar buoy, red	15 feet, low-water.
Burns' Reef	2	" "	12 " "
Wheeler's Rocks	1	" black	11 " "

Going from Hammonasset Point, North of Faulkner's Island, to New Haven.

Hammonasset Point	2	Spar buoy, red	18 feet, low-water
Madison East Reef	4	" "	15 " "
" Middle Reef	6	" "	12 " "
Charles Reef	8	" "	16 " "
Kimberly's Reef		" red & bl'k h. stripes.	14 " "
Faulkner's Island	1	" black	5 fathoms.
Chimney Corner Reef	10	" red	18 feet, low-water.
East Ledge	12	" "	15 " "
Wheaton's Reef	3	" black	15 " "
Inner Reef	14	" red	4 fathoms.
Negro Head	16	" "	12 feet, low-water.
Branford beacon		White stone beacon, with iron spindle and ball on top.	
South of Branford Point	18	Spar buoy, red	12 " "
Branford Harbor		" "	12 " "

Entering New Haven Harbor.

South-west Ledge beacon		Red iron beacon	7 feet, low-water.
Middle Reef	2	Spar buoy, red	4 fathoms.
Quixe's Ledge		Black iron spindle, cask on top	dry.
Adams Fall	4	Can buoy with staff, red	19 feet, low-water.
Party's Bar	1	" black	11 " "
Black Rock	6	" with staff, red	17 " "
Shag Bank	3	" " " black	15 " "
Beacon light on Long Wharf (red)		Square white tower.	

Going into Milford Harbor.

Welch's Point	2	Spar buoy, red	20 feet, low-water.
South end of Charles Island	1	" black	18 " "
East end of Charles Island.	3	" "	12 " "

Entering Stratford River.

Stratford River beacon		White wooden crib 13 × 13, cask on top of spar.	

Entering Bridgeport Harbor.

Outer Beacon		Beacon with cask on top of spar spar painted white and black horizontal stripes	
Inner Beacon		Beacon with cask on top of spar, spar painted white and black horizontal stripes.	

Entering Black Rock Harbor.

Black Rock beacon		Red iron beacon.	
" " buoy	2	Spar buoy, red	21 feet, low-water

Entering Port Jefferson Harbor.

Off-shore buoy		White and black spar buoy	18 feet, low-water
East Flat		Can buoy, black	5 " "

Southport Creek.

Southport beacon		White wooden crib 21 × 21, barrel on top of spar.	
" breakwater		Forms the E. side of the entrance	

Entering Norwalk River.

NAME OF STATION.	NO	DESCRIPTION.	DEPTH OF WATER AT BUOY OR BEACON.
Green Reef buoy	2	Spar buoy, red.....	18 feet, low-water.
Norwalk beacon.....		White square stone beacon, barrel on top.	

Entering Oyster Bay Harbor.

Oyster Bay Harbor buoy...	2	Spar buoy, red.....	18 feet, low-water.

Entering Greenwich Harbor.

Captain's Island buoy.....	2	Spar buoy, red.....	12 feet, low-water.
Cornel Reef.....	4	" ".....	20 " "
Greenwich Harbor, S. side.	1	" black.....	15 " "
" " N. side	2	" red.....	14 " "

LONG ISLAND.—Montauk Point is the Eastern end of Long Island: it is 75 feet high, and has on it a fixed light, 85 feet high, making the elevation of the light 160 feet. The South shore of Long Island is sandy, with the exception of a few boulders about 2 miles West from the light-house. *Long Island*

From Montauk light to Fire Island light, the course of the shore is S. 71° W., (W. by S. ¾ S.,) 67 miles, and from Fire Island light to Coney Island, the West point of the island, the course of the land is S. 89° West, 36 miles.

Fire Island light is on the East side of Fire Island inlet, and is a revolving light, 89 feet above the level of the sea.

At Pondquogue Point, in Shinnecock Bay, 33 miles W. by S. ¾ S. from Montauk, a light-house is being erected. It will be a first order Fresnel fixed light, 160 feet high, and when finished, Montauk light will be changed to a flashing light, 225 feet above the sea.

BLOCK ISLAND TO NEW YORK.—Bound into New York, if you fall into Block Island Channel, you will have soundings in lat. 40° N., 60 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; 2½ leagues distant, same bearing, you will have 28 fathoms, coarse sand. When Block Island bears N., distant 4 or 5 leagues, you cannot see any land to the Northward or Eastward; but as you approach the island you see Montauk 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 2 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 gray sand, within short distances. About 40 miles S. 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, gray 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 Woodlands, 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 in the chart. *Block Island to New York.* *Light-house.*

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 there are two light-houses.

Current. CURRENT.—In running for New York, after pasing Nantucket, particular attention should be paid to the log as well as the lead, as the set of the current is about three-fourths of a mile per hour to the Westward, and with Northerly and North-easterly winds, it is much accelerated. It requires careful attention to this fact in giving the course to be steered, or vessels will make the land to the South of the Highlands.

Pilots. PILOTS.—New York pilots are to be found from George's Bank to Cape May. By a recent decision of the New York Pilot Commissioners, it has been determined that the proper pilotage-ground is West of a line drawn from Fire Island light to Barnegat light.

Masters of vessels are requested by the Pilot Commissioners not to give up the charge of their vessels to the pilot until within sight of the marks for the harbor, as it is presumed that the master understands the navigating dependent on astronomical observations better than a pilot.

New York. 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 Hereford Bar, which lies from 4 to 6 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 Hereford 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 Absecum 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 2 miles from the beach, and is steep to. You may turn this shoal in 6 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.

Light.

In passing from Barnegat to Sandy Hook, when to the Southward of the light 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.

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 see the breakers, you may perhaps see a grove of woods 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 shipmaster 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 painted red, of about 350 tons burden, and showing two lights, is anchored off Sandy Hook. 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. by N., distant 6¾ miles; Highland light-house, W.S.W., distant 7 miles. *Light-ship.*

HIGHLANDS OF NEVERSINK.—Neversink Hills, on which 2 light-houses are built, extend N.W. and S.E., about S.W. from Sandy Hook, on the Atlantic ocean, to Raritan Bay. The correct altitudes of the following places, which present themselves to mariners as they approach them, are— *Highlands of Neversink.*

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 2 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. It is 248 feet above the level of the sea. The Northern light is a fixed light, 246 feet 7 inches above the sea. *Highland lights.*

SANDY HOOK LIGHT is on the Northern point of Sandy Hook, and is a fixed light, 90 feet above the level of the sea. *Sandy Hook light.*

Two beacons are erected on the Hook, 35 feet above the sea; the Easternmost one ranges for the buoy of the Upper Middle, and the Westernmost one ranges for the buoys of the S.W. Spit; they are both lit at night.

LEDGE SOUTH SANDY HOOK.—On this reef there are but 9 feet water. The Northern light on the Highlands a little open to the Eastward of the Southern one, leads right on the reef. *Ledge South Sandy Hook.*

This Ledge is S. ½ E. from Sandy Hook light, 7 miles distant, and about 1¼ mile from the shore, and on which the ship William Thompson struck.

OIL SPOT.—E.S.E., 1¾ mile 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. *Oil Spot.*

FALSE HOOK.—1¼ 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. *False Hook.*

NEW YORK HARBOR.—There are 4 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 South channel between the black can buoy No. 1, and the red can buoy No. 2; the third is the main ship-channel between the red can buoy No. 2, and the black nun buoy No. 1; the fourth is Gedney's Channel, between the black nun buoy No 1, and the red nun buoy No. 2. This channel runs nearly W. by N., and is used by our largest class ships-of-war. *New York Harbor.*

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 parallel to the shore, 150 yards distant, until you get Sandy Hook light to bear W., or W. by N., when you steer N. by E. to avoid the point of the False Hook, until you get deep water, say 7 fathoms, Sandy Hook light bearing S.W. ½ S., then steer W. ½ N., until Point Comfort lights are in range, and run for them until the new lights on the Highlands are in range, or if the tide is ebb, continue your W. ½ N. course until the last-mentioned lights are in range, and you are up with red nun buoy No. 12, on the S.W. Spit, when a N. 10° E. course will keep them so, and lead clear to the Narrows, with 23 feet least water at low-tide. *Along-shore Channel.*

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.

BEACON ON ROMER.—A granite beacon, 25 feet high, has been placed on the North-western point of Romer, 9 feet above water. *Beacon on Romer.*

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.

N. B.—The iron beacon on Romer Shoal, S.E. part, was carried away by the ice during the winter 1856—7. It will be replaced as soon as possible.

There is a true tide setting through the channel, the time of high-water the same as at the Hook, viz. full and change, 7h. 29m.

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.

South channel. SOUTH CHANNEL.—The red can buoy, No. 2, of the South Channel, bears from the Hook light E. ½ N. To cross the bar, steer W. by N. ½ N., leaving the above buoy on your starboard hand, and the black can buoy, No. 1, on your port hand, until you are up with the striped buoy on the Outer Middle, and the Swash Channel lights are in range, when steer for them, N.W. 4° N., until you get the Hook light to bear S.W. by W. ½ W., when if you wish to go the main channel way, you steer W. ½ N. until you get Point Comfort lights in range, when steer as before directed.

Swash Channel. SWASH CHANNEL.—To pass through Swash Channel, continue your N.W. 4° N. course, keeping the range lights on Staten Island in one, until you are up with the striped buoy on the N.W. end of Swash Channel, when the new lights on the Highlands will be in range, and a N. 10° E course will carry you to the Narrows.

North Channel. NORTH CHANNEL.—The black buoy, No. 1, of the North Channel, bears E. by N. 4° N. from Sandy Hook light; the light and Mount Pleasant in range is a mark for it; the course is W., until you get Point Comfort lights in range, then steer as before directed. To go through Swash Channel, when the channel lights are in range, steer as directed under that head.

Gedney's Channel. GEDNEY'S CHANNEL, the best water.—From the light-ship to the striped buoy, off the entrance to Gedney's Channel, the course is N.W. ½ W., distance 4½ miles. The course then is W. by N., leaving the red buoy on the port hand, until you get the light-houses on Point Comfort in range; keep them in range, (the course is W. by S. ¼ S.,) and they carry you between the Hook and Flynn's Knoll into Sandy Hook bay. When the new lights on the Highlands are in range steer as before directed.

East Channel. EAST CHANNEL.—North of Gedney's Channel buoys there is a channel over the East Bank; it is buoyed with spar buoys, having a general direction from N.W. by W. to S.E. by E.: it may only be attempted with safety in the day-time, with 14 feet. The only directions are, to keep between the buoys.

When you open the light on the bluff of Staten Island, with that on Robbins' Reef, keep them open until you pass the Narrows; this keeps you clear of the West Bank. When in the Narrows, the course to Quarantine is N.N.W. ¼ W.; from thence to the Battery the course is N.E. ¾ N.; on the Eastern side of the channel, extending from Governor's Island, there is a mud-flat, having on it as little as 11 feet; to avoid this keep Trinity Church steeple open with Castle Williams.

After you have passed the buoy of the S.W. Spit, steer N. by E. ¼ E. for the red buoy of the Upper Middle, which is 2¾ miles distant from the S.W. Spit buoy: on this course you will leave the black buoy of the Knoll on your port hand; after you get up with the red buoy of the Upper Middle, steer N. by E. until you pass the black buoy, No. 13, 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. When thus far, to pass Fort Diamond, keep near mid-channel, but the shores are bold on both sides. 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 steer up for Bedlow's Island to avoid the Mud Flat from the South side of Governor's Island; the mark for which is to keep Trinity Church steeple open to the Westward of the fort on Governor's Island. 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 Robbins' Reef, on which there is a light-house. 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 in the way to New York, it being bold 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 below Corlaer's Hook:—the Diamond Reef of 12 feet, on which there is a red spar buoy; Coenties Reef of 17 feet, and Prince's Reef of 13 feet; the channel is betwee

Light-house.

Diamond and Prince's Reef, but a pilot is necessary with a draft over 12 feet, unless well acquainted with the set of the tide and the ranges to run between the reefs.

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, or Robbins' Reef light open with the light on Staten Island.

Other Directions.—Or you may, after making the Highlands of Neversink, run in within three miles of the beach, and in steering along the Northward, keep in about 8 fathoms water, until you get the light-house to bear W. ½ 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 4½ fathoms. Pass the Hook 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 1 to 2 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 2 lights on the Highlands will range, when you may steer N. by E. ¼ 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 hours 29 minutes A. M. *High-water.*

Average rise and fall of tide on the bar, 5½ feet.

Set of tide on the Bar, and between the Hook and Romer,			first	quarter	flood,	S.W.
Do.	do.	do.	second	do.	do.	W.
Do.	do.	do.	third	do.	do.	N.W.
Do.	do.	do.	last	do.	do.	N.
Do.	do.	do.	first	do.	ebb,	N.E
Do.	do.	do.	second	do.	do.	E.
Do.	do.	do.	third	do.	do.	S.E.
Do.	do.	do.	last	do.	do.	S.

In the spring of the year, when freshets run, the flood runs to the S.W. and W.S.W.

N.B. The above answers for the Upper Middle, and buoy of West Bank, with the exception of one-half hour later.

High-water at Governor's Island, full and change, 8 hours 19 minutes, rise 5 feet 8 inches. *High water.*

Bearings from the Telegraph at Neversink Hills.

Sandy Hook light-house N. 7° W., with the West side of Fort Lafayette in a 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 2 lanterns 250 feet above the level of the sea. *Bearings*

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 and 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.

Other directions are—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 5 trees on the Highlands; you may then steer W. until you get the West Beacon on the point and the light-house in range, and so keep them till you make the red buoy of the S. W. Spit; after hauling round the spit, steer N. by E. ¼ 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 on 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 tends 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. ½ 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 port 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.

Prince's Bay light-house stands on a bluff on the West side of the bay, bearing W.N.W. from Sandy Hook light, distant 10 miles, and West from the Knoll buoy. It shows a fixed light, varied by flashes, facing E.S.E., 106 feet 11 inches above the level of the sea.

Fort Tompkins' light is on Staten Island, West side of the Narrows; it is a fixed light, 89 feet above the sea.

Robbins' Reef light is situated on Robbins' Reef, N. ¼ W., 3½ miles from Fort Tompkins' light; it is a fixed light, 66 feet above the sea.

Gedney's Channel. GEDNEY'S CHANNEL.—Least water, 23 feet. Bring the light-house on Sandy Hook to range with the black buoy, and the beacon on Romer to bear W.N.W. Steer W.N.W. with the ebb, and W. by N. on the flood, until you drop into 6 fathoms water, when the light-house will range with a clump of trees on the Highlands, with the Eastern side cut down square. You then steer for the E. beacon on the Hook, keeping it a little open on the port bow, until you get mid-channel way, when you steer for the buoy of the S.W. Spit.

Craven's Shoal. In the harbor of New York there is a shoal 2067 yards S. 30° E. (true) from the light-house on Staten Island. It lies North and South, and its length in that direction is 503 yards. The breadth from East to West is 164 yards. Soundings 18 feet at low-water. This shoal is composed of sand and shells, or stsictly, is a *shell bank.*

There are 6 lights intended as ranges for the channels:

1st. GEDNEY'S CHANNEL lights are 2 in number: the front one, on Raritan Bay, Jersey shore, is on the keeper's house, in a turret. The focal plane of the light is 40 feet above high-water. The rear light is in a tower, 76 feet above high-water. These lights in range will, after crossing the bar, clear every thing until inside of Sandy Hook.

2d. SWASH CHANNEL lights, 2 in number, are on Staten Island. The front one is in a tower—the focal plane of the light is 59 feet above high-water. The rear light is on the keeper's house, in a turret, 189 feet above high-water. These in range, when outside of the bar, will cross the bar in 20 feet water, and lead through the Swash Channel up to the red buoy of the Upper Middle, 17 feet at low-water.

3d. MAIN SHIP-CHANNEL lights, 2 in number, to be used after turning the S.W Spit buoy. The front light is in a tower—the focal plane of the light is 60 feet above high-water mark. The rear light is on the keeper's house, in a turret. The focal plane of the light is 224 feet above high-water. After turning the S.W. Spit, by keeping these in range, you run in mid-channel, until Robbins' Reef light is open with the light at the Narrows; keeping those open clears the West Bank.

They are all fixed lights.

The bearings and distances of the buoys of the Harbor of New York are given, so that if one of them is fallen in with in thick weather, the course may be shaped for the next one: Variation in 1850, 6° W.

Nun Buoys of the Bar.

Striped buoy outside the bar bears from the light-ship N.W. ½ W., distant 4 miles; from red buoy No. 2, Gedney's Channel, S.E. by E. ¾ E. nearly, distant half a mile: from black buoy No. 1, of the bar, N.E. by E., distant nearly two-thirds of a mile.

Red buoy No. 2, South Channel, bears from the light-ship W.N.W., distant 4 miles; from black buoy No. 1, South Channel, N.E. ¾ N., distant nearly two-thirds of a mile.

Black buoy No. 1, South Channel, bears from the light-ship W.N.W. ½ W., distant 4½ miles.

Spar Buoys, False Hook Channel.

Black buoy No. 1, on reef South of the Highlands, bears from Neversink lights	S.S.E.,	dist.	3½ miles.
Striped buoy bears from Neversink light	N.E. ¾ N.,	"	1¾ "
Striped buoy bears from light-ship	W. by S.,	" nearly	5½ "
Red buoy No. 2, Oil Spot, bears from striped buoy	N. ¾ W.,	"	1⅝ "
Striped buoy, point of Hook, from red buoy No. 2	N.W. by N. ½ N.	"	1¾ "

Red Buoys, Main Ship-channel—(nun buoys)—to be left on the starboard hand in entering the Harbor.

Red buoy No. 4 bears from red buoy No. 2, Gedney's Channel	W.N.W. ¼ W.	dist.	1	miles.
Red buoy No. 6 bears from red buoy No. 4, Gedneys Channel	W. by N.	"	½	"
Red buoy No. 4, Swash, bears from red buoy No. 6, Gedney's Channel	W. ¾ N.	"	⅔	"
Red buoy No. 8 bears from red buoy No. 4, Swash	S.W. ¾ W.	"	½	"
Bell-boat, Flynn's Knoll, bears from red buoy No. 8	W.S.W. ¾ W.	"	⅝	"
S.W. Spit buoy, red, No. 10, bears from Flynn's Knoll bell-boat	West	"	1½	"
S.W. Spit buoy, red, No. 10, bears from black buoy No. 5, point of the Hook	W.N.W. ¾ W.	"	1⅚	"
Red buoy No. 12 bears from S.W. Spit buoy	N. by E.	"	1½	"
Ship-channel buoy, striped, bears from red buoy No. 12	N. by E.	" nearly	1	"
Red buoy No. 14 bears from striped buoy	N.N.E.	"	1⅙	"
Red buoy No. 16 bears from red buoy No. 14	N.E. by N. ¾ N.	nearly dist.	1⅚	"
Red buoy No. 18 bears from red buoy No. 16	N. by W.	dist.	4¾	"
Red buoy No. 20 bears from red buoy No. 18	N.E. by N. ¼ N.	"	1¾	"

Black buoys to be left on the port hand in entering the Harbor—(nun buoys.)

Black buoy No. 3 bears from black buoy No. 1	W.N.W.	dist.	1⅙	miles.
Black buoy No. 5 bears from black buoy No. 3	W.S.W. ¾ W.	"	1⅚	"
Black buoy No. 7 bears from S.W. Spit buoy	N. ½ W.	"	1⅓	"
Black buoy No. 9 bears from black buoy No. 7	N. by E.	"	2	"
Black buoy No. 11 bears from black buoy No. 9	N.N.E. ¾ N.	" nearly	1	"
Black buoy No. 13 bears from black buoy No. 11	N. by E.	" nearly	1	"
Black buoy No. 15 bears from black buoy No. 13	N. ½ W.	"	1⅔	"
Black buoy No. 17 bears from black buoy No. 15	N. ½ W.	"	3¾	"
Black buoy No. 19 bears from black buoy No. 17	N.E. by N.	"	1¾	"

Swash Channel—(Can Buoys.)

Red buoy No. 4 bears from Red buoy No. 6, Gedney's Channel	W. ¾ N.	dist.	⅜	miles.
Red buoy No. 6, Swash, bears from red buoy No. 4	N.W. ¾ N.	"	⅓	"
Black buoy No. 3 bears from red buoy No. 4	W. by N.	"	½	"
Black buoy No. 5 bears from black buoy No. 3	N.W. ¼ N.	" nearly	½	"
Black buoy No. 5 bears from red buoy No. 6	W.N.W. ¾ W.	" nearly	⅔	"
Black buoy No. 7 bears from black buoy No. 5	N.W. ¼ N.	"	⅚	"
Red buoy No. 8 bears from black buoy No. 7	N.W. ¾ N.	" nearly	1	"

East Channel—(Spar Buoys.)

Black buoy No. 1 bears from the light-ship	N.W.	dist.	5	miles.
Red buoy No. 2 bears from black buoy No. 1	N.E. by N. ¾ N.	"	⅓	"
Black buoy No. 3 bears from black buoy No. 1	N.W. by W. ½ W.	" nearly	1½	"
Black buoy No. 3 bears from red buoy No. 2	W.N.W. ¾ W.	" nearly	1½	"
Red buoy No. 4 bears from black buoy No. 3	N.W. ¼ W.	"	1½	"
Red buoy No. 6 bears from red buoy No. 4	N.W. by N.	"	1⅓	"

[NOTE.—In sailing ship-channel, the black buoys are to be left on the port, and the red buoys on the starboard hand.]

THE LIFE-SAVING BENEVOLENT ASSOCIATION OF NEW YORK, chartered by the Legislature on the 29th of March, 1849. Its object is to furnish means to save lives from shipwrecked vessels, and by donations, to reward meritorious conduct and acts of courage in the preservation of human life. Its means are derived from voluntary contributions. By the aid of an appropriation from the United States government, the association has erected the following houses, and placed in them Francis' superior metallic life-boats and other facilities for communicating with wrecked vessels, and for taking persons from them to the beach. Houses have been built under the superintendance of Mr. Watts, United States Engineer, between Coney Island and Montauk Point.

Station-houses on the South side of Long Island.

No. 1 is located at Coney Island point				
2	"	4¼ miles E. of Coney Island point.		
3	"	E. side of Rockaway Inlet.		
4	"	4½ miles E. of Rockaway Inlet.		
5	"	17¾ miles E. of Coney Island point.		
6	"	½ mile W. of New Inlet point.		
7	"	3½ miles E. of New Inlet point.		
8	"	9½ miles W. of Fire Island Inlet.		
9	"	4¼ miles W. of Fire Island Inlet.		
10	"	at Fire Island light.		
11	"	3½ miles E. of Fire Island light.		
12	"	8½	"	"
13	"	12½	"	"
14	"	17	"	"
15	"	21½	"	"
16	"	26½	"	"
17	"	31½	"	"
18	"	36	"	"
19	"	41	"	"
20	"	33½ miles W. of Montauk Point light.		
21	"	26½	"	"
22	"	21½	"	"
23	"	16¾	"	"
24	"	11¾	"	"
25	"	7	"	"
26	"	⅜	"	"

On the North side of Long Island.

27	"	West end of Fisher's Island.
28	"	Oysterpond, Plum Gut.
29	"	Eaton's Neck.
30	"	Sands' Point.
31	"	Watch Hill Point.

New Jersey Shore, between Sandy Hook and Cape May

No. 1 is located at Sandy Hook, East of light.				
2	"	Spermaceti Cove, Great Beach.		
3	"	Wardell's Beach.		
4	"	Whale or Green's Pond.		
5	"	N. side Courlies' Pond, Deal.		
6	"	Squam Beach, S. side Shark River.		
7	"	"	N. side Squam Inlet.	
8	"	"	S.	"
9	"	"	near Maxon's.	
10	"	Island Beach, S. side Cranberry Island.		
11	"	"	8-mile House.	
12	"	"	North side Bat. Inlet.	
13	"	Long Beach, South side.		"
14	"	"	"	"
15	"	"	"	"
16	"	"	"	"
17	"	Tucker's or Short Beach.		
18	"	Brigantine		"
19	"	N. end of Absecum		"
20	"	S. "	"	"
21	"	N. "	Peck's	"
22	"	S. "	"	"
23	"	S. "	Ludlum	"
24	"	S. "	7-mile	"
25	"	N. "	5-mile	"
26	"	S. "	2-mile	"
27	"	Cape Island City.		
28	"	Cape May light.		

These houses are under the supervision of the Philadelphia Board of Underwriters.

Each house under the charge of the Life Saving Benevolent Association, when complete, is to be furnished with the following articles:

One metal surf-boat with air-chambers and cork-fenders, seven oars, and two India rubber bailing-buckets.

One metal life-car, with cork or India rubber floats and fenders, and rings and chains for each end.

One Manilla hawser, 4½ inch, 180 fathoms.
One hauling-line, 2½ inch, 310 fathoms.
Two rocket lines, $\frac{9}{10}$ of an ounce per yard, 300 yds. each.
One coiling frame for rocket line and box.
One crotch and range for throwing rockets.
One sand anchor, strop and bull's eye.
One tackle with 20 fathoms fall, of 2½ inch Manilla.
One heavier and strop.
One mortar of iron, and 10 shot fitted with spiral wire.
One copper powder cannister, and 4 lbs. powder for same.
Twelve blue lights and box, containing 50 quick matches.
Five rockets and rocket box of tin.
Eight pieces of match rope and 12 pieces of port-fire.
Two lanterns and oil can, and oil for same.
One lamp-feeder and wick.
One stove and pipe.
One cord of wood.
Two shovels.
One priming-wire.

JOHN D. JONES, President.

South side of Long Island.

Montauk Shoal.

MONTAUK SHOAL lies S. by E. from the light-house, distant 2½ miles, is of hard sand, extending N.W. and S.E. about one mile, having four fathoms on it, shoaling suddenly, and breaks in heavy weather. It has 12 fathoms on the inside.

Frisbie's Ledge.

FRISBIE'S LEDGE.—See pages 293 and 297.

The soundings are in general very regular, shoaling gradually as you approach the shore; there is, however, deeper water to the East of Fire Island light-house, when opposite Racoon Woods, near the shore, than in other parts of the coast; as 10 fathoms are found about a mile distant. The shoal off Fire Island light-house, composing part of the bar, extends about a mile from the shore, and one mile from where the light-house stands. It is bold to on the Eastern side, having 6 fathoms close to it; to the West of the light-house it shoals more gradually.

Fire Island Inlet is navigable for vessels drawing 9 feet water. It is subject to change, and those who are acquainted with its entrance are guided by the breakers in entering as much as by anything else.

Oak Island, Gilgo, Crow and Hog Island Inlets are all barred harbors, having very little water; they do not extend out more than half a mile from the general line of the shore.

Rockaway Inlet.

ROCKAWAY INLET lies N.E. from Sandy Hook, distant 9 miles. The bar is subject to change; 12 feet may be about the average depth at low-water, and the bar extends about 2 miles from the shore.

Barnegat to Sandy Hook.

BARNEGAT TO SANDY HOOK.—Barnegat light-house is 54 feet above the level of the sea, and contains a fixed light; it is on the Southern side of the entrance.

Buoys as they are passed entering Barnegat Inlet.

Sea buoy is a white and black striped can, No. 1, in 18 feet water, light-house bearing W. by S., Bar buoy N.W.

Bar buoy is a white and black striped spar, No. 2, in 12 feet water, light-house bearing W.S.W., Channel buoy N.W.

Channel buoy is a white and black striped spar, No. 3, in 14 feet water, light-house bearing S.W.

Port side of Channel buoy is a black spar, with a cross, in 10 feet water, light-house bearing S.S.W.

Bulkhead buoy is a white and black striped spar, No. 5, in 13 feet water, light-house bearing S.E. by E.

Buoy on a wreck is a red and black striped spar, No. 6, in 6 feet water, light-house bearing E. by S.

South Bulkhead buoy is a red spar, in 5 feet water, light-house bearing E.S.E.

After making the sea buoy steer N.W. one quarter mile for the Bar buoy No. 2, which pass on either side, and continue on three-eighths of a mile to Channel buoy No. 3, from which steer N.W. by N. for the point of North Beach, and when within 100 yards of it steer N.W. ½ N. for the Black buoy with a cross on it on the port side of the channel, leaving it on the port hand. Then steer W., three-quarters of a mile, for Bulkhead buoy, No. 5. ; thence S.S.E. for buoy No. 6, which is on a wreck, to which you must give a good berth. Leave it on either hand, and steer for South Bulkhead buoy. You have then good anchoring-ground all the way up to the Westward to Point of Beach.

The shore, from Barnegat to the North end of Long Branch, is nearly straight, running N. by E. ½ E., 33 miles. It then bends gradually to the N. to the latitude of Sandy Hook light-house, distant 9 miles from the Northern part of Long Branch. Variation, in 1850, 5° W.

The beach North of Barnegat is bare of timber, until nearly up with Squam Inlet, (19 miles;) but the pines, which are on the main-land from 2 to 3 miles inside, show plainly over the sand-hills.

The Woodlands, which commence about one mile south of Squam, are close to the shore, and extend to Long Branch, 8 miles.

Long Branch is that part of this shore where low table-land shows itself close to the beach; numerous houses are built on it, and they are generally known to the seamen as "the Tavern houses." It is about 5 miles in length.

North of Long Branch the beach is low, and nothing remarkable until up with the entrance to Shrewsbury River, opposite the light-houses on the Highlands of Neversink, where it is free from sand-hills, and when the entrance is closed, which is sometimes the case, it appears perfectly level. After passing this flat part, distant about 6 miles from Long Branch, the cedars on Sandy Hook commence, and extend up to the light-house.

Squam Inlet is navigable for small vessels; and as they are frequently detained at anchor on the inside of the bar, strangers, not knowing their latitude, have supposed themselves opposite Barnegat from seeing them at anchor. At Barnegat the pines show as remote from the shore, while at Squam they are near.

The shore between Barnegat and the Highlands may be approached within one-third of a mile by all classes of shipping, in clear weather, in the day-time; and there is nothing to fear, save a spot to the North of Long Beach, about one mile from the beach, on which there are but 14 feet. It lies S.S.E. from the light-house on the Highlands, distant 3 miles.

Although vessels, in clear weather, may venture with safety near this part of the Jersey shore in the day-time, they cannot be too careful in thick weather and at night; and when in less than 13 fathoms water should keep the lead constantly going, as there are many places on this coast where 10 and 12 fathoms depth may be found within one or two miles of the shore, where the bottom is irregular, and where your approach to the beach can only be known by the rapid change in depths.

Soundings between Cape May and Montauk Point.

The average extent off the coast of New Jersey is 60 miles; this will take you to the Forty Fathoms Line, from which it shortly afterwards deepens to 50 and 100 fathoms. The Forty Fathoms Line extends itself parallel with the coast until up with Barnegat, when it begins to widen, and from thence extends over towards Montauk Point; S.S.E. from which, 40 miles, you have 40 fathoms; 65 miles, 50 fathoms; and 80 miles, 100 fathoms.

When you get soundings on the edge of this bank, and are uncertain as to your position, never rely on soundings *once or twice* to determine it, but sound frequently, projecting your course, distance, and depth of water, the same scale as your chart, on a clean sheet of paper. After you have continued the same for sufficient time to get a profile of the ground sailed over, compare the depth and changes by cutting out such parts of your projection where there are no soundings, so as to enable you to slide it over the chart to such place as it will correspond; or, what is better, make your own projection and soundings on transparent paper, and slide it over such parts near which you suppose yourself to be, until the profile of depth corresponds with it, preserving the meridians on both parallels.

NOTE.—The chart of approach to New York has been published by the U. S. Coast Survey, and by attention to the above one may navigate with the greatest safety with it, bearing in mind that a single depth of water will no more give you your location at sea, than your altitude above the sea would give your position on the land. If you wish to navigate with the lead, in addition to having a good chart, you must watch the changes as you would the aspect of a country over which you are travelling.

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: *Coast Southward of Sandy Hook.*

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 can then 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 taverns, at Long Branch, and S. E., 15 miles, from Sandy Hook light-house.

SANDY HOOK, CAPE MAY, AND CAPE HENLOPEN.—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. *Sandy Hook, Cape May, and Cape Henlopen.*

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 3 inlets, one of which is fit, at high-water, for vessels drawing 15 feet, viz.: Little Egg Harbor, as below. 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 5 inlets before you come up with Cape May light, viz.: Coston's, Townsend's, Hereford, Turtle Gut, and Cold Spring, all of which have bars lying off their entrance; when abreast of Hereford 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. by S. from Cape May light, 15½ miles distant, lies Five Fathom Bank, with 12 feet water on it. The South end bears E.S.E. from Cape May, and from Cape Henlopen it bears E. ½ N., 21 miles distant, and ranges N. and S. It is dangerous for vessels with over 10 feet water.

LITTLE EGG HARBOR light is a fixed white light varied by red flashes, on Tucker's Island, near the entrance to the harbor; the tower is red, 50 feet high. *Little Egg Harbor. Light.*

The light is about 18 miles in a S.W. by W. direction from Barnegat light. Vessels making it should not steer to the N. of N.E. until they make Barnegat light.

This notice is deemed necessary, as the land at Barnegat runs nearly in a N. by E. direction, and to one not acquainted, both lights being of the sme character, the Tucker's Beach light would be apt to make him haul to the Northward too soon.

About midway between the light at Little Egg Harbor and that of Barnegat, there is a large hotel, which is a good mark to know the land by.

SOD CHANNEL.—Coasters bound to the Northward will generally make this harbor, when caught by a North-easter, after having passed to the Northward of it, and before being able to make Sandy Hook. In running down within sight of the land, pass the house near the point of Long Beach, giving the breakers off the Old Inlet a berth of half a mile, and keeping in 24 feet water until the light-house on Tucker's Island bears N.W. by W. High-water 7h. 10m., rise 4 feet. *Sod Channel.*

Being in 24 feet water, fine black sand, with the light-house on Tucker's Island bearing N.W. by W., steer W. by S. for the outer buoy, near the middle of the entrance of Sod Channel.

While abreast of Tucker's Island, and before reaching the outer buoy, there will not be much tide, and the least water will be 10 feet at low-water. When up with the outer buoy, the S.W. point of Tucker's Island being 900 feet distant to the Westward, steer S.W. ½ S. for the middle buoy, keeping on the outside. Strong tide will here be met—the flood setting over the shoal off the point of Sods, and the ebb setting over towards the Round Shoal, for which allowance must be made. Turn the middle buoy in 19 feet water, and steer for the inner buoy. With a scant wind and an ebb-tide, vessels will be obliged to anchor here, or even before reaching this point. With a change of tide a better anchorage will be found further up, between Anchoring Island and the marsh to the Northward. This part of the harbor, from the

N.W. extremity of Anchoring Island to Hatfield's store, is 1¼ mile long, and a quarter of a mile wide.

Vessels coming from the Southward, and wishing to enter by the Sod Channel, will bring the light-house on Tucker's Island to bear N. ½ W., and steer for it, giving the Round Shoal a berth. When the hillock on the South end of the island bears W. ½ N., haul up W. by S. for the outer buoy, and afterwards follow the directions given above.

South Channel. SOUTH CHANNEL.—Vessels from the Southward will give the Brigantine Shoals a good berth, keeping 4 fathoms water until the Northernmost house on Brigantine Beach bears N.W. by N., then steer N. by W. ¼ W., if the weather be clear. Hatfield's store on the marsh, will be seen ahead, 4½ miles distant. Keep on this course until the Northern house on the Brigantine Beach bears N.W. by W. ¾ W., when they will be between the breakers on the South point of the Round Shoal and those on the beach; then haul up to the N.E. ¾ N., and continue on that course three-quarters of a mile, until the Northern house on Brigantine Beach bears West, and the S. E. point of the sand hillock on the South end of Tucker's Island bears N. ¾ W.; haul in then N. ¾ W., and steer for this hillock until nearly up with the middle buoy, after which proceed as before directed.

Buoys as they are passed in entering Little Egg Harbor by the East Channel.

Sea buoy is a black and white striped spherical buoy, No. 1, with an 8 feet stem, in 18 feet water, Tucker's Beach light bearing N. by W., bar buoy of East Channel S.W.

Bar buoy of East Channel is a black and white striped can, No. 2, in 11 feet water, light-house bearing N. by E., East Channel buoy W.N.W.

1st. East Channel buoy is a black and white striped can, No. 3, in 13 feet water, light-house bearing N.N.E. ¼ N., buoy No. 4 W.N.W.

2d. East Channel buoy is a black and white striped can, No. 4, in 18 feet water, light-house bearing N.E. by N., buoy No. 5, N. by W.

East and North Channel buoy is a black and white striped can, No. 5, in 20 feet water, light-house bearing N.E. by E. ½ E., buoy No. 6 N. by W.

Main Channel buoy is a black and white striped spar, No. 6, light-house bearing N. E. by E., B. S. Willet's house N. by W.

After making the sea buoy, steer S.W. half a mile for bar buoy, No. 2, then W.N W. one mile for No. 4, passing when half-way buoy No. 3; then steer N. by W., three-fourths of a mile for No. 5, and continue on three-fourths of a mile to Main Channel buoy, No. 6, thence for B. S. Willet's house, until near Anchoring Island, and giving the East point of the same a berth of 200 yards, steer N. by W. into the harbor.

To enter by North Channel when up with sea buoy No. 1, as in East Channel, steer N.W. three-fourths of a mile for buoy No. 1½, then W.N.W. half a mile for buoy No. 5, and then as directed above.

Absecum Inlet. 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 there are only 10 feet water. The ground is broken, having between the lumps 4 and 5 fathoms.

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.

There is an iron bell-boat, painted red, with the word "*Absecum*," just outside of the outer shoals off this inlet, in 5 fathoms water, 2¼ miles from the South point of the inlet. The bell is rung by the action of the sea. The following are the compass bearings from the boat, viz.:

Absecum Inlet	N.W. by N.
Do. light-house	N.W. ½ N.
Outer buoy of Absecum Bar	N.

The course to clear Brigantine Shoals is N.E. by E.

Light. The light is on the South side of the inlet, and is a fixed white light, 16 feet above the level of the sea.

Buoys as they are passed in entering Absecum Inlet.

Sea buoy is a white and black striped spherical buoy, No. 1, with a 6 feet stem, in 15 feet water. Absecum light-house, W. by S., Holdzkom's house, (Brigantine Beach,) N.E. by N.

1st. Channel buoy is a white and black striped can, No. 2, in 9 feet water. Holdzkom's house bearing N.E. ¼ E., Absecum light-house W.S.W.

2d. Channel buoy is a white and black striped can, No. 3, in 9 feet water, Holdzkom's house bearing N.E. by E., Absecum light-house S.W. by W.

Harbor buoy is a black and white striped spar No. 4, in 10 feet water, Horner's house bearing W. by S., Absecum light-house S.W. ¼ S.

When up withse a buoy, No. 1, steer due West five-eighths of a mile, for buoy No. 3, passing No. 2 about midway, then W.N.W. one-quarter of a mile for No. 4, then S. until you can clear the North beach about 100 yards, and then follow up the South beach, steering N.N.W., and anchor at discretion. Least water on the bar 9 feet.

GREAT EGG HARBOR.—The following can buoys, white and black, in horizontal stripes, have been placed to mark the channel at Great Egg Harbor. *Great Egg Harbor.*

No. 1 buoy is in 20 feet water. From it the North point of Peak's Beach bears N. W. by W. No. 2 buoy is in 15 feet water. No. 3 buoy is in 42 feet water. From it No. 2 buoy bears S. by E. No. 4 buoy is in 22 feet water. From it No. 3 buoy bears E. by N. No. 5 buoy is in 20 feet water. From it the hotel on Somer's Point (the Northern house) bears N.W.

To enter the inlet steer the following courses, viz :—From No. 1 to No. 2 buoy, N. W. ¼ N.; from No. 2 to No. 3 buoy, N. by W.; from No. 3 to No 4 buoy, W. by S.; from No. 4 to No. 5 buoy, W. by S. ½ S.; from No. 5 N.W. until half-way to Somer's Point, then keep close to the North shore, to clear a wreck that lies near the port side of the channel.

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 8½ fathoms water, Cape May light-house bearing W. by N. ¾ N., distant 15¼ miles; the centre of the shoalest ground, on which is found 12 feet water, bears N.E. ¼ E. from the light-ship, distant 1¾ 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 bold on its Eastern edge, as there are 7 fathoms half a mile to the Eastward of the shoal water. On its N.E. edge is a black nun buoy, marked F.F., in 6 fathoms. *Five Fathom Bank.*

The Bank, having on it 4 and 5 fathoms, is 9 miles long, in a N. and S. direction, and has an average breadth of 1½ mile, in an E. and W. direction.

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.

McCRIE'S SHOAL, OFF CAPE MAY.—This shoal bears 7¼ miles South-east from Cape May light-house, and has 17 feet water upon it. W. by N., one and one-eighth of a mile from McCrie's Shoal, there are 18 feet water on a small spot. Another shoal, 15 miles E. S. E. from Cape Henlopen light-house, with 4¼ fathoms water upon it. There is a red run buoy, No. 2, near its S.E. edge, in 5 fathoms water. *McCrie's Shoal, off Cape May light house.*

South-east, 1½ mile from Congress Hall, there is a shoal one mile in extent, on which there are only 6 feet water. There are 3½ fathoms inside of it. It is called Old Eph.

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 84 feet, contains a revolving light, and makes a revolution in 4 minutes, interval between 2 flashes of greatest brilliancy 80 seconds, at the distance of 10 miles. The light is not totally eclipsed, although much more dim than at the brightest period. It bears N.E. by N. ¾ N. from Cape Henlopen light, distant about 10½ miles. Variation, in 1850, 4° W. *Cape May light-house.*

South-west from Cape May light, half a mile distant, there is a shoal of one-fourth of a mile in extent, having on it 10 feet water.

The South point of Crow Shoal bears W. 22° N. from the light, distant 1¼ mile. The shoal is 4 miles in extent, in a North direction, having on it only 7 feet in places.

There is good anchorage and a 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.

CAPE MAY.—Vessels approaching the Delaware by Cape May, will get the light to bear N.W. by W. ½ 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 10 feet water. *Cape May.*

Running for the light, keep about 2 miles to the Northward and Eastward of it, until about three-quarters of a mile from the shore. 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 port hand, over which it conti-

nually 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. until you deepen into 7 and 8 fathoms. In running the above course, you will have from 5 to 1½ fathoms at low-water on Crow Shoal, before you come into 8 fathoms, which is 5 miles 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., 3 leagues, which will carry you into the main channel, between the Brandywine light-boat on your port, and Cross Ledge on your starboard hand, bearing N.N.W. ½ W. and S.S.E. ½ E. from each other, distant 11¾ miles.

Cross Ledge has a beacon boat with one mast, moored on it in summer; and in winter a buoy. On its S.E. edge, a red nun buoy, No. 10. in 5 fathoms water.

On the first of the flood the tide sets to the Westward, and in light winds should be guarded against, by steering from 1 to 2 points more to the Eastward, and on the ebb the contrary.

There is a red nun buoy with a cross on it on this shoal, in 7 feet water, on the foundation of the light-house.

The foundation bears.....N.N.E., distant 15 yards.
The Ledge light-vessel.....S.S.W.
The Kedge buoy.....S. by W. ½ W., distant three-quarters of a mile.

In running the above course, you will have 3, 3½, and 2¾ fathoms, until 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 until 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 14 Feet Bank, (which has a black nun buoy on the S.S.E. end,) and then alter your course to N.N.W. for Cross Ledge. High-water 8h. 19m., rise 6 feet.

Cape Henlopen light. CAPE HENLOPEN LIGHT is 180 feet above the level of the sea, containing a fixed light. S.E. by S. of the 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 7 miles. On the S.W. Point is a red nun buoy, No. 4, in 4 feet of water. Brandywine Shoal bears N. ½ W., distant 11¼ miles. On its N.W. edge is a red nun buoy, No. 6, in 6 fathoms water.

The beacon 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 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 light-house bears S.E., and anchor in 4 fathoms, good holding-ground.

E. ½ S. from Cape Henlopen, 25 miles, is a shoal, with 4 fathoms on it, gray sand.

Bring Cape Henlopen light to bear W., and run for it until within 2 miles; when abreast of it, you will have 15 or 16 fathoms water. After you have passed it, steer W.N.W. until you bring it to bear E.S.E., when you may anchor in 3 or 4 fathoms, near the breakwater.

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 white fixed light, varied by flashes, 46 feet high, 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 4 to 5 hundred yards, and when you bring the West end of the breakwater to bear N.W., steer for it, and anchor as close on the works as you can with safety, the light on the West end bearing about N., or N. by W.

Brandywine light BRANDYWINE LIGHT is an iron light-house. The light is fixed, and 47 feet above the sea. It is on the South part of the shoal, in 8 feet at low water.

It bears from Cape May light N.W. by W. ½ W., 8 miles distant; from Cape Henlopen, N. ¾ W., 12½ miles.

There is a fog-bell on the light-house, which, in foggy weather, gives seven strokes at intervals of 5 seconds, then a pause of half a minute, then 7 strokes again.

One and three-fourths of a mile, on a N. by W. course from the light-house, there is a red nun buoy, No. 6, on the Northern point of the shoal in 6 fathoms.

There is a fixed light, 38 feet above the sea, at Mispillian, South side of Delaware Bay.

Cape May light bears E.S.E., 7¾ miles, from the light-boat.

Delaware Bay and River. DELAWARE BAY AND RIVER.—In running up the Bay, Henlopen light bearing S. ½ E., steer North, a little West, for the black can buoy, No. 5, of the Brown, which bears N. 4° W. from the light, 9¼ miles distant, which you leave to the West-

ward; keep on that course until up with the Brandywine light, then steer from the light to the light-boat, near Cross Ledge. Your course, on the flood-tide, is N.W. by N. ½ N., and on the ebb, N.N.W., the distance 11¼ miles. Soundings from 4½ to 8 fathoms. You leave the buoy on the North end of the Brandywine Shoal to the Eastward, and the one on the 14 feet bank to the Westward: the former being 1¾ and the latter 5 miles from the light-boat.

The tides are influenced very much, in direction and strength, by the winds; but as the channel is well defined by the two light-boats, (which are moored in line with it,) in connection with the buoys, there can be no difficulty in clear weather.

You make Egg Island fixed light bearing about North, soon after leaving the Brandywine: it is upon a dwelling-house, elevated 45 feet, visible 12 miles. N.W. by W., 1½ mile from the buoy on the 14 feet bank, is the Southern extremity of Joe Flogger, or Folger Shoal, a narrow ridge running N.N.W., 15 miles, nearly dry in places, and forming for that distance the West side of the main channel. In beating up do not stand to the Westward into less than 4 fathoms. In thick weather Joe Flogger may be safely tracked along the whole extent, hauling on to 4 fathoms, hard, and deepening off to 5 and 6 fathoms, soft.

The ledge light-boat shows a single light, elevated 45 feet, visible 7 miles, and is moored about mid-channel between Joe Flogger and the buoy on the lower end of Cross Ledge, which is a narrow ridge of hard sand on the East side of the channel, 4½ miles in length, and nearly dry in places. Leave the light-boat to the Westward, close aboard, and the course then to the Middle is N.W. by N. ½ N., on the flood, and N.N.W. on the ebb tide, distance 4 miles, soundings from 7½ to 5 fathoms. These courses carry you about mid-channel between Joe Flogger and Cross Ledge. From the buoy of the Middle unto Bombay Hook Bar, the Thrum Cap, (the lower of two insulated clumps of trees on the Western shore, bearing S.W.,) the course is N.W. ½ W. on the flood, and N.W. by N. on the ebb, distance 9 miles. Soundings from 5 to 6½ fathoms. Bombay Hook Bar is very bold; the soundings in the channel off it are from 6 to 6½ fathoms. It should not be approached nearer than 5 fathoms.

There is a fixed light 45 feet above the sea, on the S.W. side of Haystack Island, New Jersey shore, bearing about West from Egg Island light.

Cohansey light.

Cohansey light, on the Jersey shore, is in sight from the buoy of the Middle, bearing N.N.W. ¼ N.; it is upon a dwelling-house, elevated 46 feet, and visible 12 miles. Mahon light is also upon a dwelling-house, elevated 30 feet, visible 10 miles, and is in sight, bearing W. by S. ½ S. Egg Island light bears E. by S. ½ S. The above 3 lights are all fixed.

Lights.

When nearly up with the Northern end of Joe Flogger, Bombay Hook light will be made just open with Bombay Hook Point, and bearing N.W. It is elevated 46 feet, and is visible 12 miles. When up with Bombay Hook Point, Reedy light will be made, bearing N.W. by N., elevated 55 feet, and visible 14 miles. Both of the above are fixed lights.

The channel Westward of Joe Flogger cannot be considered available until it is buoyed.

The following directions are given, because it has sometimes been entered by mistake, and considerable embarrassment experienced in working back, to get into the main channel again. This channel is as direct as the main channel, though not so wide. The Southern extremity of Joe Flogger Shoal, as already observed, bears N. W. by N., 1½ mile from the buoy on the 14 feet bank. Entering with that buoy bearing East, 1½ mile, steer N.W. by N. ½ N., which course will carry you along the Western side of the shoal, in not less than 4 fathoms, until Mahon light bears W. by N., when you strike a middle-ground 1½ mile long, least water 13 feet; having passed it, you drop into 4 fathoms again.

When the buoy of the Middle (main channel) bears E. by N. ½ N., and Mahon light W. by S. ½ S., steer N.W. by N. ½ N., and you pass through into the main channel, a little below the Thrum Cap, and in not less than 3¾ fathoms.

The following directions will also serve for this channel, and with a head tide, more safely than the foregoing:—Entering as before directed, track the West side of the channel along, shoaling to 3½ and deepening to 4 and 5 fathoms, until Mahon light bears W.N.W., when you take your soundings from Joe Flogger cautiously, (not shoaling to less than 3 fathoms, for the shoal is very bold,) and carry 3½ to 4½ fathoms through, between it and the Middle Ground. When past the Middle Ground track the West of the channel along as before.

Note.

NOTE.—Courses and bearings magnetic, and distances are in nautical miles. Variation, in 1850, 3° 30′ W.

The name of Blake's Channel has been given to the channel West of Joe Flogger, which was made known in the progress of the U. S. Coast Survey.

From Bombay Hook Bar to Liston's, (the tree bearing South,) the course is N.W. ½ N., distance 11 miles; soundings, as far as Bombay Hook light, 6 to 4½ fathoms, and

between the light and Liston's 3½ to 3¼ fathoms being the least water in any part of the channel between Cape Henlopen and the Pea-patch.

From Liston's, (the tree bearing South,) to give Stony Point bar a berth, steer for Port Penn Piers, a little to the Westward of Reedy Island light, 1½ mile, or until Barney's house, on the Delaware shore, (yellow, with 2 single poplars near it,) bears S.W. by W., soundings 4 fathoms; then your course is N. by E. ¼ E., 4 miles, to Salem, or Elsingborough Point, on the Jersey shore; soundings, up to the middle of Reedy Island, 4 to 5 fathoms, then deepening to 7 and 8 fathoms. There are 2 channels to pass the Pea-patch: for the Eastern, or Goose Island Channel, track the Salem flats along, which commence at Elsingborough Point, hauling on and off, shoaling to 3½, and deepening to 5 and 6 fathoms.

When up with the North end of the Pea-patch, take your soundings from the New Jersey shore, hauling on to the flat to 3, and deepening to 4 fathoms, tracking the flat along until New Castle spire bears N. by W., when you are clear of the North-eastern end of Bulkhead Shoal, and may haul out into the middle of the river.

The channel Westward of the Pea-patch is divided by a middle-ground, commencing about midway between the Pea-patch and Delaware shore, and following the bend of the river about 1½ mile; least water upon it 10 feet.

The channel Westward of this Middle is narrow; least water 20 feet. To take it, run from Elsingborough Point for the Pea-patch, until up with Reedy Point, from which the shore trends suddenly to the N.W.; then track the flats on the Delaware shore along, passing between the E. and W. buoys, and near the W. buoy, up to the Hamburg buoy.

The channel East of the middle is not so difficult; least water 13 feet. When up with Reedy Point, take your soundings from the Pea-patch side, and track the flats up to the E. buoy, and then the middle to the Hamburg buoy.

From New Castle to Marcus Hook the general course of the river is N.E. by N., 11½ miles. The best water off the Eastern shore, until past Cherry Island flats, a middle-ground off Christiana Creek, about 2½ miles long; least water 11 feet. Having passed the flats, the best water is off the Western shore; keeping it pretty well aboard, you clear Marcus Hook Bar, which lies off that place.

At the mouth of Christiana Creek there is a fixed light, 48 feet above the sea.

From Marcus Hook to Chester the course is about N.E. by E., 3¼ miles; best water off the Western shore. When one mile above Chester, you are up with the buoy on the spit which makes down the river from Tinicum Island, which you leave to the Westward. The trend of the river is then nearly East of the bar, below Fort Mifflin, upon which there are 2 buoys.

Cross the bar between the 2 buoys, and steer for Fort Mifflin, passing to the Northward of the Old Pier, which lies off that work. The river then trends Eastward again up to the Horse-shoe, upon which there is a buoy, which is to be left to the Northward.

At Fort Mifflin, on a pier in the river, there is a fixed light, 28 feet above the sea.

Having passed the Horse-shoe, the trend of the river is nearly North up to Kaighn's Point, the best water on the Eastern shore, until the Canal Basin, on the Pennsylvania side, bears W. by N.; steer across the river, and keep the Western shore aboard up to the city.

Remarks. REMARKS.—The harbor of Reedy Island is much used, particularly in winter, while ice is running. A small spit makes South from the lower end of the island half a mile: being clear of this, your course is North. Anchor off the piers, in 4 to 6 fathoms, mud.

Bombay Hook Roads is an anchorage much used by vessels waiting wind or tide. Bring Bombay Hook Point to bear S. by E., the light W. by N., and anchor in from 3 to 4 fathoms, sticky bottom.

The above directions are by Lt. George S. Blake, U. S. Coast Survey, excepting the Goose Island channel, which was re-surveyed in 1845—6, by Lt. Arthur, the change in the channel having made it necessary.

TIDE TABLE.

MOON.	S.E. by E. S.E. S.E. S.S.E. S. by E. S. S.S.W. S.W.	makes full sea at	Cape May. Cape Henlopen. Brown and Brandywine. Bombay Hook. Reedy Island. New Castle. Chester. 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.

Light-houses in Delaware Bay, the Eastern side :

A fixed light on Egg Island Point	Lat. 39 10 28
A fixed light at Cohansey Creek	39 20 15

On the Western side :

A fixed light at Mispillion Creek, on a dwelling-house	38 56 33
A fixed light at Mahon's Ditch, on a dwelling-house	39 10 13
A fixed light at Bombay Hook, on a dwelling-house	39 21 43
A fixed light on Reedy Island	39 29 57
A fixed light at Christiana River	39 43 12

The following sailing directions for entering Delaware Bay, are given by Lieutenant R. Bache, in connection with these buoys :

Rickard's Channel.

RICKARD'S CHANNEL.—Vessels drawing 15 feet water can pass through this channel at ordinary low-water—smooth sea.

Blunt's Channel.

BLUNT'S CHANNEL.—Not yet buoyed.

Through Channel to Breakwater.

THROUGH CHANNEL TO BREAKWATER.—Vessels drawing 16 feet can pass through this channel at ordinary low-water—smooth sea.

The rise of the tide may be estimated at 5 feet. Strong tides running, an allowance of two points must be made on the course steered, crossing the direction of the tides. The lead is a guide. The shoals, although pretty steep to, can be avoided by constant and true soundings.

When off the boarding-houses on Cape Island, in the Coaster's or Cape May channel, buoy No. 1, on Eph's Shoal, will be seen W. by N. ½ N. per compass—steer for it, leaving it close on board on starboard hand in passing—when up with buoy No. 1, buoys Nos. 2, 3, 4, 5, and 6 in clear weather will be in sight.

To pass through the "Through Channel" to Breakwater.

TO PASS THROUGH THE "THROUGH CHANNEL" TO BREAKWATER.—This channel is narrow ; on the S.E. is a shoal with 7 feet water upon it, and the Round or E.N.E. shoal is to the Northward, and has 4 feet water upon it, and the breakers show plainly in any breeze. When abreast of No. 1, on Eph's shoal, stand W. ¾ N. towards buoy No. 3, keeping it open on the port bow a point, and gradually hauling up for it. When up with No. 3, leave it on the starboard hand, and steer S. W. by S. for No. 2, which leave close on board on starboard hand, and continue on S.W. by S. for Breakwater.

To pass through Rickard's Channel.

TO PASS THROUGH RICKARD'S CHANNEL.—This channel lies between Crow and the Mummy shoals ; the Crow shoal having on it 7 feet water, and the Mummy shoal 6 feet water. After passing buoy No. 4, it is a good beating channel.

From buoy No 1 steer N.W. ¾ W. for No. 4, which leaves No. 1 on the starboard hand at a short distance, and steer N.N.W. Westerly for No. 5, which pass on either hand, and haul up N.W. ½ W. Westerly for No. 6, which pass on either hand, and shape your course W. ½ N., which brings you between the buoy and the Brown and light-boat on the Brandywine Shoal, in the main ship-channel.

NOTE.—All soundings are given at *low-water*.

Beacons and buoys as they are passed in entering Delaware Bay and River.

NAME OF STATION.	NO.	DESCRIPTION.	DEPTH AT LOW-WATER AT BUOY OR BEACON.
Five Fathom Bank, N.E. part		Nun buoy, black, marked "F. F."	36 feet.
S. end of Hen and Chickens	1	Spar buoy, red & bl'k h. stripes.	25 "
McCries' Shoal	2	Nun buoy, red	5 fathoms.
Tail of the Shears	3	" black	3 "
S.W. point of Overfall	4	" with staff and triangle, red	40 feet.
Buoy of the Brown	5	Can buoy, black	6 fathoms.
Boyd's Shoal	7	" "	20 feet.
Brandywine Shoal, N.W. part	6	Nun buoy, with flag, red	6 fathoms.
Fourteen-feet Bank	9	" black circular mark	31 feet.

NAME OF STATION.	NO.	DESCRIPTION.	DEPTH AT LOW-WATER AT BUOY OR BEACON.
Tail of Joe Flogger.....	11	Spar buoy, red and black hor. stripes	17 feet.
Miah Maul Shoal	8	Nun buoy, with triangle, red	4 fathoms.
Swash of Joe Flogger.....	13	" black	21 feet.
Foundation of light-house .	10½	" red	7 "
Cross Ledge	10	" with cross, red	5 fathoms.
Buoy of the Middle.....	12	" bl'k & white per. stripes	33 feet.
Ben Davis' Point.....	14	" with flag, red.....	23 "
North end of Joe Flogger..	15	Can buoy, black	17 "
Goose Point.....	15½	Nun buoy, black	15 "
Ship John Shoal.....	16	" with triangle, black....	4 fathoms.
Bombay Hook Bar	17	Can buoy with cross, black	6 "
Arnold's Point.....	18	Nun buoy, red	20 feet.
Baker Shoal.....	20	" "	4 fathoms.
Reedy Island Spit.....	19	Spar buoy, black	15 feet.
S. Spit of the Pea-patch ..	21	Nun buoy, red and bl'k hor. stripes	21 "
S. end of Middle Ground...	22	Spar buoy, red	19 "
East buoy of Main Channel	24	" "	3 fathoms.
West " " "	23	" black	17 feet.
Bight of Hamburgh Bar....	25	" "	15 "
N. end of Middle Ground ..	26	" red, tipped with white ..	20 "
Finn's Point, East Channel	28	" "	19 "
Goose Island Flats, East Channel	27½	" "	14 "
Bight of the Bulkhead.....	27	" black	2 fathoms.
Mouth of East Channel....	30	" red	15 feet.
N. end of Bulkhead Shoal.	29	Nun buoy, bl'k and red hor. stripes	15 "
S. end of Cherry Island Flats	31	Spar buoy, red and bl'k hor. stripes	2 fathoms.
N. " " " "	33	" " " "	3 "
Marcus Hook	32	" red	25 feet.
S. end of Chester Island Flats	34	" "	21 "
N. end of Chester Island Flats	36	" "	3 fathoms.
Tinicum Spit.....	35	" black	20 feet.
West Bar buoy	37	Spherical buoy, black	3 fathoms.
East " "	38	Spar buoy, red	17 feet.
Horse Shoe buoy.....	39	" black	4 fathoms.

To mark the Channel at Cape May and Maurice River Cove.

East end of Eph's Shoal ..	1	Spar buoy, bl'k and red hor. stripes	2 fathoms.
West end of " "	2	" " " "	2 "
South end of Mummy Shoal	3	" black	21 feet.
Through Channel	4	Spar buoy, with cross arm marked B. W., black and white.....	4 fathoms.
South end of Crow Shoal ..	5	Spar buoy, bl'k and red hor. stripes	2 "
Rickard's Channel.....	6	" black and white.....	3 "
" " W. end .	7	" " "	3 "
S. end of Dead Man's Shoal	8	" red and bl'k hor. stripes	11 feet.
N. " " " "	9	" " " " "	9 "

The Hen & Chickens.

THE HEN AND CHICKENS.—On this shoal there are 5 feet water, in places. The Southern point, on which there are 13 feet water, bears S.E. by S., 2½ miles, from Cape Henlopen light. The beacon in range with the light on the breakwater puts you on the edge of the shoal. On the Southern part is a spar buoy, red and black horizontal stripes, No. 1, in 25 feet water. Coasters may pass inside, and follow the beach around the Cape.

Inside of the shoal, and parallel to the shore, there is a channel of 4½ to 5 fathoms.

Cape Henlopen to Cape Henry.

CAPE HENLOPEN TO CAPE HENRY.—The coast is studded with shoals, lying at a distance off, from 3 to 6 miles, to the nearest point of land. The Cap, on which there are 3 fathoms, lies S.E. Easterly, 6½ miles.

Indian River Shoal, of 3 fathoms, bears S.S.E. ½ E., 11 miles, from Cape Henlopen light.

FENWICK'S ISLAND SHOAL.—The centre of this shoal is in 38° 27′ 30″ N. lat., and in 74° 56′ 09″ W. long. It is about 2 miles long, running from S.W. to N.E. The least water on it is 15 feet. It bears S.E. by S. ¼ S., distant 11 miles, from Indian River Inlet, and E. ½ or ¾ N. from the North end of Fenwick Island. On the seaward side the soundings change suddenly from 10 to 2½ fathoms, and there are 10 fathoms about 2 miles West of this shoal, which appears to be extending on the West side and towards the North. *Fenwick's Island Shoal*

There is an iron bell-boat off the middle of this shoal, in 10 fathoms water, Fenwick's Island bearing by compass W. ¼ S., distant 6½ miles. The boat is close to the outer edge of the shoal, which is very steep, and runs N.E. and S.W. Vessels finding themselves unexpectedly in with the boat, should make Easting before shaping a course for the Delaware or any other Northern port. The hull is painted black, the mast red. The bell rings by the action of the sea.

ISLE OF WIGHT SHOAL, on which there are but 3 fathoms water, lies 4 miles S. ½ E. from the centre of Fenwick's Island Shoal. It is nearly 6½ miles East of the beach, and bears East from the Isle of Wight woods. There are 10 fathoms water within a mile on either side of this shoal. *Isle of Wight Shoal.*

Midway between these two shoals there is a spot with 3½ fathoms water on it.

LITTLE GULL BANK is S.W. by S., 10 miles, from the Isle of Wight Shoal, and has 12 feet water on it. *Little Gull Bank.*

GREAT GULL BANK is 15 miles S.W. by S. from the Isle of Wight Shoal, and has 3½ fathoms on it. *Great Gull Bank.*

THE SINEPUXENT SHOALS are several knolls near the shore, inside of Fenwick's Island Shoal, having 3½ fathoms on them at low-water. *Sinepuxent Shoals.*

CHINCOTEAGUE LIGHT is a fixed light, 80 feet above the level of the sea, and is on the S.E. point of Chincoteague Island, lat. 37° 55′, long. 75° 21′. This light can be seen about 12 miles in clear weather. From Chincoteague to Cape Charles the land trends S.S.W. ½ W., with several barred inlets. The land is low, sandy, and marshy. Variation, in 1850, 3° W. *Chincoteague light.*

WINTER QUARTER SHOAL is one mile long and one-third of a mile wide, running in a direction E. by N. ¾ N., and W. by S. ¾ S., with not over 3½ fathoms water upon it. The least water is 12 feet, in several places, at low-tide. On the seaward side the soundings change suddenly from 9 to 4, and then to 2 fathoms. It is 6¼ miles distant from the nearest land, with 10 fathoms water between it and the shore. In clear weather the lantern of Chincoteague light house is just visible from it. The centre of the shoal bears from Chincoteague light E. by N. ½ N., distant 11½ miles. This is a highly dangerous shoal, as the soundings change suddenly, and it lies directly in the track of vessels. The sea breaks upon it in heavy weather. *Winter Quarter Shoal.*

CHINCOTEAGUE SHOAL is a long narrow bank or ridge running in a direction N.E. ½ E. and S.W. ½ W., 4¾ miles long, with an average width of a quarter of a mile, and distant from 4½ to 6 miles from the shore, with from 3¼ to 5 fathoms water upon it. Its North end bears E. by S., distant 7¼ miles, and its South end S.E. ½ S., distant 5¾ miles from the light-house. *Chincoteague Shoal.*

A dangerous shoal lies S. by E. ¾ E., distant 4¼ miles from the light-house, with 3 feet water upon it.

Another, with 9 feet water upon it, lies S. ¾ E., distant 4½ miles from the light-house.

Another, with 9 feet water upon it, lies S., distant 3¾ miles from the light-house.

Within a semicircle of 12 miles, the light-house being the centre, the bottom is exceedingly broken and uneven. The general set of the current along this part of the coast is to the Southward and Westward; and vessels from the West Indies and Southern ports, bound into Delaware Bay, have been set inshore among these dangers by it. The coast in this vicinity is dangerous for large vessels navigated by persons not well acquainted with it. Vessels supposing themselves in this vicinity, after striking 11 and 12 fathoms of water, should keep the lead going, and keep a bright look-out. In the day-time, large vessels should not approach nearer the land than 8 or 9 miles, with the trees just in sight from the deck; nor at night, even in clear weather, when coming from the Southward, nearer than just to keep the light in sight, until it is brought to bear, by compass, to the Southward of West. After that it will be necessary to keep further off, and run it out of sight, in order to avoid "Winter Quarter Shoal."

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. *Rehoboth Bay.*

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 Inlet. CHINCOTEAGUE INLET.—The following buoys, black and white, with perpendicular stripes, have been placed at the entrance of Chincoteague Inlet:

Buoy No. 1, on Chincoteague Bar, is a can buoy, in 10 feet water. From it Chincoteague light-house bears N.E. by E. Buoy No. 2, inside the bar, is a spar buoy, in 8 feet water; buoy No. 1 bears S.E. Buoy No. 3, on the lower end of Williams' Shoal, is a spar buoy, in 9 feet water. From it Buoy No. 2 bears S.E. Buoy No. 4, on the upper end of Williams' Shoal, is a spar buoy, in 20 feet water. Lone tree, on Wallop's Island, bears W. by S. All the above buoys have black and white stripes.

Directions. DIRECTIONS.—Bring buoy No. 1, or bar buoy, W.N.W., and run for it, leaving it on the starboard hand, close aboard, then stand for buoy No. 2, which stands in mid-channel, and then for buoy No. 3, thence to buoy No. 4. When up with the last, stand W. by S. for a lone tree on Wallop's Island, and anchor within about 200 yards.

Matomkin Harbor. 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 port 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 outer bar up the inlet the navigation is very dangerous, being filled with oyster-beds.

Matomkin outer bar buoy is a red nun buoy, No. 2, in 10 feet water. Chincoteague light bears N.E.

The inward buoy is a black nun buoy, No. 1, length of staff 10 feet. The south point of Matomkin Beach bears from the buoy North; Paramore's Beach, S.W. by S. To cross the bar, run from the outer to the inner buoy. There are 8 feet, at low-water, on the bar. Rise of tide 5 feet.

Hog Island light. HOG ISLAND LIGHT is a fixed light, 60 feet high, on the S.E. point of Hog Island, 16 miles N.N.E. from Smith's Island light.

Hog Island outward buoy is a black and white nun buoy, in 12 feet water. The light-house bears N. by W. ½ W. from the buoy; Revel's Island, North. To cross the bar, range the outward and middle buoys, and run to the middle, then run from the middle to the inward buoy. The shoal water is crossed between the outward and middle buoys, and is 9 feet at low-water.

The middle buoy on the bar is a black and white nun buoy, in 24 feet water. The light-house bears from the buoy W.N.W.; Prout's Island Point, S.W. ½ W.

The inward buoy is a black and white nun buoy, in 30 feet water. The light-house bears W.N.W. from the buoy; Prout's Island Point, W.S.W.

White Point buoy is a red nun buoy, in 15 feet water, to be left on the starboard hand coming in. Hog Island light bears from the buoy E.N.E.; Prout's Island Point, E.S.E.

Buoy in the mouth of the Deeps is a black and white nun buoy, in 13 feet water. Hog Island light bears E.; Prout Island, S.E.

Buoy in lower Draft is a black and white nun buoy, in 36 feet water. Hog Island light bears E.S.E.; upper bluff woods, N.

Buoy in upper Draft is a black and white nun buoy, in 36 feet water. Revel's Island bluff bears N.E. by E.; Hog Island light, S.E. by E.

Elbow buoy is a black and white nun buoy. Upsher's Point bears from the buoy N.W. by N.; Fowling Point, S.W. by W. Depth of water, 21 feet. The tide flows in this channel 6 feet.

Each of the above buoys has an 8 feet staff with a cross on top.

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 or 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 Southerly current, which in general runs from 1 to 1½ knot an hour.

Capes of Virginia. 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 have lights on them. 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.

CAPE CHARLES LIGHT is a revolving light, 69 feet above the sea, and is on Smith's Island, 4 miles from its S.W. point, lat. 37° 07′ 48″, long. 75° 52′ 12″. Magnetic variation, in 1850, 2° W. *Cape Charles light-house.*

E. by S. ¾ S. nearly, distant 7 nautical miles from Smith's Island light-house, is a shoal, with 3¼ fathoms upon it at low-tide, with 7 fathoms water between it and the land. *Shoal.*

S.E. by E. nearly, distant 4¾ miles from Smith's Island light-house, is another shoal, with 17 feet water upon it at low-tide, and 5 fathoms water between it and the land.

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 7¼ fathoms. Keep on till 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.

CAPE HENRY lies 12 miles S. by W. from Cape Charles, both of which form the entrance to Chesapeake Bay. On it is a light-house, the lantern of which is elevated 129 feet above the level of the sea, showing a fixed light. *Cape Henry light-house.*

When coming in 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 to 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.

For Hampton Roads.

FOR HAMPTON ROADS.—When abreast of Cape Henry, and the light-house bears S.S.W., distant about 2½ miles, steer W. by N. till you get on the Horse-shoe, in 5 fathoms, sandy bottom. There are no soundings at 5 fathoms on that course between Cape Henry and the Horse-shoe. The first soundings as you approach the Shoe, on this course, are 6 and 7 fathoms, a sticky or tough bottom, at about 4 miles from the light-house on Cape Henry; and a mile further on, (say about 5 miles from the light-house,) you will have the 5 fathoms, sandy, on the tail of the Shoe, 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. These 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 bank of Willoughby's Point, where there is a light-vessel; then bring the light on Old Point Comfort W. or W. by S., and steer for it until nearly up with it, say within half a mile; then haul up S.W. by W. till you bring the light on Old Point Comfort to bear N.W., when you steer S.W., passing between Fort Calhoun and Old Point, for the Roads, 5, 6, or 7 fathoms, good anchoring.

The centre of the Castle (Fort Calhoun) is S. 17° E. from the light-house at Old Point Comfort, distant about one mile.

Old Point Comfort light bears from Cape Henry light W.N.W., distant 15 miles; it is a fixed light, 48 feet above the level of the sea, and is a guide for vessels bound into Norfolk or Hampton Roads. High-water 8h. 22m., rise 3 feet.

A light-vessel, painted red, has been stationed off Willoughby's Bank, in 3½ fathoms water, and exhibits two fixed lights.

Old Point Comfort light-house,	bearing	W. ½ N.,	2 miles.
Back River Point	"	" N. ¼ W.,	5 "
Cape Henry	"	" E.S.E.,	13 "

Vessels going out or coming into Hampton Roads, should not pass to the Southward of this vessel. She may be distinguished in the night from the light on Old Point Comfort by having two lanterns, the forward one elevated 48 feet, and the after one 35 feet. A bell will be rung in foggy weather.

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 N. 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. After passing Fort Calhoun, be careful of the shoal which extends from it W.S.W., and bending to the South, connects with the bar off Sowell's Point.

From Hampton Roads to Norfolk the channel is intricate to strangers, and we should recommend anchoring in the Roads, 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 some 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 port 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.

A light-vessel, painted lead color, and having one light at her mast-head, 33 feet above the sea, has been placed at the extremity of Craney's Island Flats, in Elizabeth River, in 4½ fathoms.

LYNHAVEN BAY.—When entering the Capes, and it is advisable to anchor in Lynhaven Bay, you may run in clear of the Middle Ground, when the light-house on Cape Henry bears 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 do this, steer West until you have advanced to within a short distance of the light-house (say half a mile); then rounding the point you may haul into the bay and drop anchor, as most convenient, in from 7 to 4 fathoms. *Lyn-Haven Bay.*

REMARKS.—If in going along the Southern side of the channel bound to Hampton Roads, you shoal your water to less than 5 fathoms, haul off to the Northward, and keep in about 6 or 7 fathoms, until you judge yourself nearly up with Willoughby's Point. By hauling to the Northward, you will deepen your water. On the Horse-shoe side of the channel the bottom is hard sand, and on the South side it is soft bottom, until drawing on towards Willoughby's Point, when it becomes hard; therefore, being on the South side, where the ground is soft, you may always know your drawing up with Willoughby's Point as soon as you get hard bottom. Go no nearer Willoughby's Point than 7 fathoms.

The Thimble is a small lump, E .15° N. from Old Point Comfort light-house, distant 1¼ miles, and on the North side of the channel, with about 9 feet water on it; near it in 5 fathoms water, is a red nun buoy, with the name "Thimble" on two sides, in black letters. It is steep to, say 7 fathoms, but being small, is quickly passed. It lies a little below the shoal off Willoughby's Point (where the channel is about 1 mile wide); to avoid it is the reason why it is necessary to get soundings first on the Horse-shoe. Near the Thimble you will have sticky bottom, and on the Horse-shoe hard sand. The Thimble may be considered as on the edge of the Horse-shoe, and when Back River Point light, which is a revolving one, bears N.N.W., you are abreast of it. *The Thimble.*

THE HORSE-SHOE.—The tail of the Horse-shoe, on which is a black nun buoy, with the name "Horse-shoe," in large white letters, in 29 feet water, lies about 5 miles N.W. from Cape Henry light-house, and 12 miles east from the light-house on Old Point Comfort: the least water in that place is 4 fathoms, hard sand, broken ground. The Southern edge of this shoal runs W. ½ N., until it connects with the main shore, a little to the North of Old Point Comfort, forming the Northern side of the channel into Hampton Roads. The N.E. side extends in a N.W. direction, until it connects with the Pocosin Flats, nearly up to the entrance to York River, and forms the Western side of the Bay Channel. There is good anchorage on the Horse-shoe, from the tail to within 3½ or 4 miles of the shore, and the smaller class of vessels may go nearer in. *The Horse-shoe.*

TIDE.—The flood-tide runs in round Cape Henry and Lynhaven Bay until 8 o'clock, on the full and change, in the mid-channel; and out of the way of the Chesapeake stream it flows at 8; in Hampton Roads at 8h. 22m., rise 3 feet. As the tide varies considerably in its direction according to the time from ebb to flood, and is influenced by the wind, attention should be paid to the bearings of the lights, as well as to the soundings, when running either up to Willoughby's Point or towards New Point Comfort, for fear you cross the channel. The ebb from James' and York Rivers sets over the Middle Ground to the Eastward, which renders the navigation there dangerous in the night or in thick weather. *Tide.*

Buoys arranged as they are passed in going from Cape Henry, through Hampton Roads, to Norfolk and Portsmouth.

NAME OF STATION.	NO.	DESCRIPTION.	DEPTH AT LOW-WATER AT BUOY OR BEACON.
Fog-bell at Cape Henry ...		Bell on frame-work, 40 feet above the sea, strikes 7 times per minute	
Buoy on Tail of Horse-shoe		Nun buoy, black, with "Horse-shoe" in white letters	29 feet.
Buoy on the Lump.....		Can buoy, red, "Lump" in black letters.....	17½ "
Lower Crump's Hill Shoal-water		Nun buoy, black and white stripes.	32 "
Upper Crump's Hill Shoal-water		Can buoy, " " " ..	31 "
Thimble		Nun buoy, red, "Thimble" in black letters	5 fathoms.
Willoughby's Shoal.....		Light-vessel, 2 lights, name on both sides, painted red	

NAME OF STATION.	NO.	DESCRIPTION.	DEPTH AT LOW-WATER AT BUOY OR BEACON.
Fog-bell at Old Point Comfort		Bell on frame-work, 30 feet above the sea, strikes 7 times per minute	
N.E. end of Hampton Bar	1	Spar buoy, black	9½ feet.
Sewell's Point	2	" red	22½ "
Lower shoal-water off Sewell's Point		" white and black stripes	23 "
Upper shoal-water off Sewell's Point		" " " "	23 "
Boush's Bluff Shoal	3	" black	4 fathoms.
Stanworth's stake	4	" red	25 feet.
Craney Island		Light-vessel, lead color, one light, name on both sides.	
Lambert's Point	5	Spar buoy, black	22 "
Old wrecks		" black and white stripes	23 "
Spinner's Point	6	" red	4 fathoms.
Spit below Portsmouth	8	" "	

Cape Henry, or Lynhaven Bay, to York River. CAPE HENRY, OR LYNHAVEN BAY, TO YORK RIVER.—As Cape Henry S. by 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. by 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. by 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.

Light-vessel. A light-vessel, painted yellow, and showing one fixed light, 40 feet above the sea, is anchored off York Spit.

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 Pocosin, 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, akreast 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.

Light. The light-house on Back River Point contains a revolving light, elevated 35 feet above the level of the sea, and serves as a guide for vessels bound into the river, as well as to assist vessels bound up the bay.

New Point Comfort, Mobjack, Bay, and Severn River. NEW POINT COMFORT, MOBJACK BAY, AND SEVERN RIVER.—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 up 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, in Mobjack Bay, where you will be secure from Northerly or N.E. winds.

Light. On New Point Comfort, which forms the Eastern side of Mobjack Bay, is a light-house containing a fixed light, elevated 60 feet above the level of the sea.

James River. JAMES RIVER.—There is a fixed light at White Shoal, in James River, 27 feet above the sea. Also one at point of shoals and one at deep water shoals, both 27

feet high, and fixed. There is also a fixed light at Jordan's Point, 35 feet above the level of the sea. All the above are furnished with fog-bells.

Vessels at anchor in Mobjack Bay are exposed to the wind from E.S.E. to S.E., and should in that case 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 landlocked from all winds. In running for this river, you will make two bunches of trees on your port 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. There is a shoal of 16 feet, 4 miles S.E. of New Point Comfort.

CAPE HENRY UP THE BAY TO THE POTOMAC RIVER, &c.—[Magnetic variation, in 1850, 2° W.]—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. *Cape Henry up the bay to the Potomac River, &c.*

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 to. In standing to the Westward, you may go in 3½ or 4 fathoms without danger; but in standing to the Eastward do not go in less than 8 fathoms, as you will be near the Middle Ground.

Back River Point light is a revolving light, 35 feet high, and bears from *Light.*

Cape Henry	N.W. ¼ W.	16 miles.
Old Point Comfort	N.N.E.	5½ "
New Point Comfort	S.	13¼ "

After you are clear of the Middle Ground, as before directed, (Cape Henry bearing S.S.E.,) and having a fair wind, you may steer up the Bay, North, 6 leagues. Do not come to the Westward of North until you have Gwinn's Island, (which is about 3 leagues North of New Point Comfort,) bearing W.N.W. from you, to avoid a dangerous shoal called the Wolf Trap, which lies N.N.E., 2 leagues, from New Point Comfort light-house, and S.E. from Gwinn's Island, which is small.

A light-vessel, showing 2 lights, is anchored near the Wolf Trap. The forward light is elevated 30 feet, the after one 38 feet; she is painted lead color, with the name on her sides.

When past the Wolf Trap steer North about 11 leagues, which will carry you up the mouth of the Potomac River. In running the above course you will have from 10 to 4 fathoms before you come up with the Tangier Islands. If, as you approach these islands, you shoalen your water to 3 fathoms, hard bottom, you must haul a little to the Westward, when you will deepen your soundings. You will pass the light-vessel off the mouth of the Rappahannock on the port hand. This light-vessel is anchored on the end of the shoal off Windmill Point, and shows one light: she is painted straw color.

If the wind should be ahead, be careful as you approach Lower Tangier Island that you do not get hooked in behind the spit which extends off from the Southern point S.W. about 4 miles; and do not, until you pass it, bring the light-house on Smith's Point to bear to the West of N.W. (See Tangier Islands.)

There is a fixed light on the North side of the channel leading to Pungoteague Creek, elevated 50 feet above the sea. *Light.*

When Little Watts Island, (which lies E. by S. from the South end of Lower Tangier, 4 miles distant, and on which is a fixed light, 46 feet above the sea,) ranges with the trees on Lower Tangier, you will begin to deepen your water from 5 to 10 and 12 fathoms, muddy bottom; continuing your course North until Smith's Point light-house, which is on the Southernmost point of Potomac River, bears W., and keeping rather on the Tangier side, you will be in 10 or 12 fathoms water. Should you deepen your water to 15 or 20 fathoms, you will be very near the spit which extends off from Smith's Point into the bay E.S.E., about 4 miles, and on the end of which is a light-vessel showing two lights. (See directions from Rappahannock to Smith's Point.) *Light.*

The light-house on Smith's Point shows a fixed light, at an elevation of 82 feet above the level of the sea. *Light.*

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.

When Smith's Point light-house bears West of you, and soundings in 10 or 12 fathoms on the Tangier side, as before directed, you may 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. Or if you 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.

ght- house. On Point Lookout there is a light-house containing a fixed light, 37 feet above the sea, in a lantern on the keeper's dwelling, 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 West, three-quarters of a mile distant, you will have 3½ fathoms, sticky bottom.

New Point Comfort to Rappahannock River. Light-ship. NEW POINT COMFORT TO RAPPAHANNOCK RIVER.—From this point a spit extends S.E. 2 miles, which you will avoid by not going into less than 4 fathoms water. The Wolf Trap lies about 5 miles N.N.E. from the light, on New Point Comfort: on it there are 12 feet at common tides, and between it and New Point Comfort there are 8 or 9 fathoms, and near it, 7 fathoms water. A light-ship is anchored near this shoal, showing two lights. The shore from New Point Comfort up to Cherry Point, the N. point of Gwinn's Island, is not bold to, but you can feel your way, keeping in not less than 4 fathoms. A spit extends off North from this point some distance, and, should you wish to harbor in the Piaukatank, after turning it haul over towards Stingray Point, from which a spit puts off E. about 2 miles, and keeping your soundings on the starboard side of the river, you may haul up S.W., choosing your anchorage in 3 fathoms water, secure from all winds.

If you wish to go into Rappahannock River, off which lies a light-vessel painted straw color, with one light 34 feet above the sea, showing the end of the spit extending from Windmill Point, which you leave on your starboard hand, keep your soundings on the port hand, in from 3 to 7 fathoms, and do not deepen your water more than 7 fathoms to the Northward, to avoid the sand-spit which runs off from the Northern point, of the river (Windmill Point,) which is very steep, but keep the Southern side in the above depth of water, when you may anchor in 7 or 8 fathoms, good bottom; or you may anchor on the Northern side of the river, about one mile above Windmill Point, within a short distance of the shore, in 3 fathoms water, good bottom, secure from all winds.

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 about 3 miles from the point to the S.E. by E., and forms a broad shelf at 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, 2 miles distant, and showing one light.

Buoys to mark the Channel up the Rappahannock River, arranged in order as they are passed.

NAME OF STATION.	NO.	DESCRIPTION.	DEPTH AT BUOY OR BEACON.
Sturgeon Creek Bar	1	Black spar buoy	21 feet.
Punch-bowl Bar	3	" "	3 fathoms.
Tapley's Point Bar	2	Red "	19 feet.
Lower Jones Point Bar	5	Black "	25 "
Dumpling Rocks	4	Red "	15 "
Corner Rock	6	" "	16½ "
Bowler's Rock	7	Black "	20 "
Russ' Rocks	8	Red "	22 "
Upper Jones Point Bar	9	Black "	16½ "
Mangorite Marsh	10	Red "	3 fathoms.
Naylor's Hole, East Bank	18	" "	2 "
" " West "	15	Black "	2 "
Mulberry Island Bar	20	Red "	2 "
Blind Point in Gumbottom Reach	17	Black "	20 feet.
Green Bay Point	12	Red "	21 "
Middle Ground Port, Tobago Reach.	14	" "	13 "
Lower end of Port Royal Reach	16	" "	13 "

This flat makes out two-thirds the way across the river. The buoy is in sticky bottom.

There is a light-vessel off Bowles' Rock, lead color, and showing one light. *Light-vessel.*

In coming up, red buoys with even numbers must be left on the starboard hand; black buoys with odd numbers must be left on the port hand. Buoys with white and black perpendicular stripes are in mid-channel, and may be passed on either hand; and buoys with red and black stripes have channel-ways on either side of them. Bearings are magnetic.

RAPPAHANNOCK TO SMITH'S POINT.—From the light-vessel off Windmill Point to the end of the Flat off Smith's Point light, which is the South side of the Potomac River, the course is N. ½ E., and the distance 5½ leagues; you may run this in 6 or 7 fathoms water. After passing Windmill Point, be careful, in standing to the Westward, to keep the light on Smith's Point open, to avoid a spit which puts off from Dammeron Marsh, about 9 miles North of Windmill Point. 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 4 miles E.S.E. from the point: on its extremity there are only 2 fathoms water, and very near to it, Eastward, there are from 10 to 20 fathoms. The mark for the shoalest part of this spit is a house with a white chimney, standing among the trees on the shore within Smith's Island, (Smith's Point is sometimes called Smith's Island.) It is separated from the main-land by a creek. We mention this, as there are two other Smith's Islands, one at the mouth of the bay, and the other opposite the mouth of the Potomac, (on both of which are light-houses,) open to the Northward of the island, and bearing West. 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. *Rappahannock to Smith's Point.*

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 Eastern side of the channel, and the flats which extend Westward from them.

A light-vessel has been stationed off this spit in 4¾ fathoms water, showing two lights; the foremost one elevated 35 feet, the after one 39 feet. Vessels passing either up or down the bay, should avoid going between it and Smith's Point. She is lead color. *Light-ship.*

TANGIER ISLANDS.—Lower Tangier lies S.E. from the mouth of the Potomac River: it is about 4 miles in length, being mostly marsh, with small hummocks of firm soil, on which the inhabitants have built their houses. A cluster of pine-trees on the Southern part of the island is the only timber now standing, and a collection of wooden buildings close to them, whitewashed, used during camp-meeting, serve to point out the Southern point of a chain of islands, which extends on the Eastern side of the channel of the bay, as far as Kedge's Straits. *Tangier Islands.*

Upper Tangier lies N. a little Westerly of Lower Tangier, separated by an opening, which is very shallow, of 3 miles in width: it is called generally Smith's Island, is about 7 miles in length, being directly opposite the Potomac River, and resembles Lower Tangier, save that it is wooded in several parts, towards the centre and North

Fog Point light. end. A light-house, showing a fixed light, 30 feet above the sea, has been erected on Fog Point, the N.W. point of the island; the tower is on the keeper's house. Point Lookout light bears from it W., 13 miles distant. This light serves as a guide to Kedge's Straits, and also to warn you of the bar which puts off S.W. from Holland's Island.

These islands are intersected by creeks, navigable only by canoes: the shores are not to be approached except by vessels of light draft of water. The flat extending off on the Western side, narrows the channel of the bay, and the spit off the S. end of Lower Tangier extends S.W. about 4 miles from the cluster of trees spoken of; but you may edge off and on in what manner you please, keeping your lead constantly going. The inhabitants are a hardy, honest, and industrious set of men, accustomed to the navigation of the bay, and on making a signal, should assistance be wanted, it will be rendered promptly.

Tangier Sound. TANGIER SOUND.—If you wish to go into Tangier Sound, bring Windmill Point to bear S.W. by W.; steer N.E. by E., and you will get soundings on the Tangier Bar, in 5 fathoms; the cluster of pine-trees and buildings on the South part of Lower Tangier will then be seen bearing N.E. of you, and you may edge off and on the Southern side of the bar in what depth you please, from 3 to 15 fathoms, bottom hard and sandy; but it is not advisable to come nearer the Tangier Bar than 6 fathoms, as it shoalens from 6 to 2 fathoms in 200 yards; should you wish to anchor, when the cluster of trees bears W. of you, haul up to the Northward and Westward, where there is good anchorage for small vessels, secure from Westerly winds, in a bay called Crocket's Bay, about S.E. from the houses in the middle of the island, and N.E. of the cluster of trees. If you proceed up the sound, it is proper to get soundings on the Watts' Islands side, as it is rather more gradual, steering parallel with the islands on your starboard hand N., and keeping in mid-channel; when Great Fox Island bears E. of you, which has a few pines on it, you will see a tall poplar on Jaine's Island bearing N.E. by N.; haul towards it, steering N.N.E., and keeping your soundings on the starboard side of the channel, to avoid the flat which puts off from Horse Hummock, on which are some houses and apple-trees; keep this course until the poplar bears S.E. of you, when you will steer N.N.W., getting soundings on your port hand on Terrapin Bar; you will then see a house with a clump of cedars on the N. point of Upper Tangier, called Kedge Island, which you will steer for when it bears W.N.W., keeping in not less than 2 fathoms water, and giving it a berth of about 100 yards. Continue this course until the fixed light on Fog Point bears S., when you may steer S.W. to clear the point of the spit which puts off from the S. point of Holland's Island. This spit is about 4 or 5 miles in length, of hard sand and irregular bottom. Should you wish to go to the Nanticoke, Manokin, or Annemesix Rivers, you can obtain a pilot soon after entering Tangier Sound by hoisting a signal.

Light-house.

Light. There is a fixed light, 36 feet above the sea, on Clay Island at the Northern extremity of Tangier Sound.

Light-ship. A light-ship is moored off the tail of the bar at Jaine's Island, painted cream color, with one light 30 feet above the sea.

To mark the channel leading through Kedge's or Cage's Straits from the Bay into Tangier Sound.

Buoys. Evans' Island buoy, No. 2, red, numbered on 4 sides, is in 18 feet water. From it Terrapin Point bears S.E. ½ S.; Fog Point light-house, S.W. by W.; Piney Island, N.E. by E. The bottom is sticky. The buoy is 20 feet in length, and must be left on the starboard hand in passing from the bay through the straits into Tangier Sound.

Muscle Hole Bar buoy, No. 1, black, numbered on 4 sides, is in 14 feet water. From it Solomon's Lump bears W. by S.; Poplar Tree on Jaine's Island, S.E. ½ E.; Piney Island, N.E. ½ E. This buoy is 18 feet in length, and must be left on the port hand passing from the bay through the straits into Tangier Sound. The bottom is sticky.

To mark the channel into and through Tangier Sound from down the Bay.

Buoys. South Tangier buoy, No. 1, black, numbered on 4 sides, is in 19 feet water. From it the South end of Tangier Island bears N.N.W. ½ W.; Watts' Island light-house, E. ½ S.; North end of Upper Watts' Island Bluff Pines, N.E. by E. The bottom is hard. The buoy is 25 feet in length, and must be left on the port hand in passing up the Sound.

Buoy on S.E. Bar, black, No. 3, is in 19 feet water, South end of Tangier Island bearing W. by N.

Terrapin Sands buoy, No. 3, black, numbered on 4 sides, is in 17 feet water. From it the poplar tree on Jaine's Island bears S.E. ½ E.; light-boat off Jaine's Island Spit, S. ½

W.; Deal's Island, N. by W. The bottom is hard. The buoy is 20 feet in length, and must be left on the port hand in passing up the Sound.

Piney Island Bar buoy, No. 4, red, numbered on 4 sides, is in 16 feet water. From it Terrapin Sands Point bears S.W. ½ W.; Fog Point light-house, W. by S.; Jaines' Island light-boat, S. ½ W. The bottom is hard. The length of the buoy is 23 feet, and must be left on the starboard hand in passing up the Sound.

Little Deal's Island Shoal buoy, No. 6, red, numbered on 4 sides, is in 18 feet water. From it Fog Point light-house bears S.W.; Piney Island, E.N.E.; centre of Big Deal's Island, N. by E. The bottom is sticky. The buoy is 21 feet in length, and must be left on the starboard hand in passing up the Sound.

Drumming's Shoal buoy, No. 8, red, numbered on 4 sides, is in 18 feet water. From it Clay Island light-house bears N. by W.; lower end of Deal's Island, S. by E.; Stump Point, N.E. This buoy is 20 feet in length, and must be left on the starboard hand in passing up the Sound. The bottom is soft mud.

To mark the channel in Wicomico River, Md.

Evans' Shoal buoy, No. 2, red, numbered on 4 sides, is in 17 feet water. From it Scott's Point bears S.E. by S.; Stump Point, N. ½ W.; centre of Sandy Island, N.W. ¼ N. The bottom is soft. The buoy is 20 feet in length, and must be left on the starboard hand passing in.

Wallace's Shoal buoy, No. 4, red, numbered on 4 sides, is in 18 feet water. From it Stump Point bears N.W. by N.; Scott's Point, S. by W. ¼ W.; Sandy Island, N. W. by W. The bottom is soft. The buoy is 20 feet in length, and must be left on the starboard hand passing in. The turn here is very short.

Lower Corner buoy of Great Shoal, No. 1, black, numbered on 4 sides, is in 14½ feet water. From it Scott's Point bears S.W. by W. ½ W.; Stump Point, N.W. ½ N.; Sandy Island, N.W. ½ W. The bottom is soft. The buoy is 18 feet in length, and must be left on the port hand passing in. The turn here is very short.

Middle Turn buoy of Great Shoal, No. 3, black, numbered on 4 sides, is in 10 feet water. From it Scott's Point bears S.S.W. ½ W.; Stump Point, N.W. ½ W.; Sandy Island, N.W. by W. ½ W. The bottom is soft. The buoy is 18 feet in length, and must be left on the port hand passing in. The turn here is very short.

Upper Corner buoy of Great Shoal, No. 5, black, numbered on 4 sides, is in 10 feet water. From it Scott's Point bears S.W. by W.; Rock Creek Point, W.S.W.; Sandy Island, W.N.W. The bottom is soft. The buoy is 23 feet in length, and must be left on the port hand passing in. The turn here is short round to port.

Little Watts' Island and Pocomoke Bay.

LITTLE WATTS' ISLAND AND POCOMOKE BAY.—There is a light-house on this island exhibiting a fixed light, 46 feet above the sea. The island is small, and forms the Western point of Pocomoke Bay. A long spit extends off from it S.W. about 5 miles; you can keep on the edge of it in from 3 to 5 fathoms water, if bound up this bay, and anchor either under the East side of Great Watts' Island, or on the opposite side, when you must take a pilot if bound to either Apes' Hole or Pocomoke River.

Spar buoys in Pocomoke Bay, (Chesapeake.)

Buoys.

On the bar at Little Watts' Island, painted black, No. 1, depth at low-water spring-tide, 16 feet—bottom hard. Bearings per compass:—Light-house on Watts' Island, N. W. ½ W.; North end of Upper Watts' Island, N. by W. North end of Rogue Island, N.E. ½ E.

On Rogue Island Bar, painted red, No. 2, planted in hard bottom.

On the N.E. end of the bar off Upper Watts' Island, painted black, No. 3. Depth at low-water, spring-tide, 9 feet—hard bottom. Bearings per compass, Watts' Island light-house, S.W. by W.; North end of Upper Watts' Island, W. by N.

On the end of Sikes' Bar, painted red, No. 4. Depth of water, at low spring-tide, 11 feet—hard bottom. Bearings per compass, centre of Upper Watts' Island, S.W.; Sikes' Island, N.E. by E.

On the Middle Ground, painted black, No. 5. Depth of water at low spring-tide, 11 feet—hard bottom. Bearings per compass, Apes' Hole Creek, N.; clump of high trees on Upper Watts' Island, S.W. ¼ S.

Off Gunby's Rock, painted black, No. 7. Depth of water at low spring-tide, 9 feet. Bearings per compass, upper end of Sikes' Island, E.S.E.; West end of Tunnell's Island, S.S.W.

Little and Great Watts' Islands, with the Fox Islands, divide Tangier Sound from this bay; there is a narrow passage for vessels drawing 5 feet water, at the North of Great Watts' Island into Tangier Sound, and save that, there is no other passage between these islands.

Potomac River. POTOMAC RIVER separates Virginia from Maryland. Its entrance is between Smith's Point on the South side, and Point Lookout on the North; on both of these points there are light-houses; the distance between them is 10 miles.

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, leaving the light-house on Piney Point on your starboard hand, which will carry you abreast of Ragged Point, lying on the port 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 port 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, giving it a small berth; from thence the courses to Georgetown are about midway the river, the flats showing on each side in most places.

Light-house. The light-house on Piney Point shows a fixed light, 35 feet above the sea. It is about a mile above George's Island, on the East side of Potomac River.

Lights. Other lights in the Potomac are: Blackstone's Island fixed light, 46 feet above the sea; Lower Cedar Point light-vessel, between Cedar Point and Yates' Point; Upper Cedar Point light-vessel, opposite the mouth of Tobacco River and Jones' Point fixed lights, near Alexandria, 35 feet above the sea.

If you are bound to St. Mary's River, you must give the shoal off Point Lookout 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 two leagues. On the South, or port 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 North into the river, and anchor on the South side of Newton's Point, in 5 or 4½ fathoms water.

Smith's Point to Cove Point. SMITH'S POINT TO COVE POINT.—From the light-vessel at the end of the shoal off Smith's Point to Cove Point, the course is N. by W. ½ W., distant 32 miles, which course will carry you in mid-channel until nearly up with the light-house on Cove Point, which you will make on your port bow; your soundings will decrease to 6 and 7 fathoms, and as you approach Cove Point they will deepen. Should you shoalen your water in steering as above, when you approach Barren Island Bar, you must haul to the Westward.

Light. When you are up as far as Point Lookout, on which is a fixed light, 30 feet above the sea, 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 2, hard sand: the Western side is more regular. Your course from Point Lookout is West, 3 miles distant, 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 first point South 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.

Should you be nearer in with Point Lookout than 3 miles, and the wind from the West, you may steer N., 2 leagues, which will carry you parallel with the shore, past Point No-Point; then steer N. by W. ½ W., for Cedar Point, 3 leagues, which will bring you up with it, and if you continue on up the bay a N. course, 5 miles distant, will bring you up to Cove Point. (See Holland's Island and Barren Island.)

If you should stand in towards the "Red Cliffs," between Cedar Point and Cove Point, do not shoalen your water to less than 4 fathoms, as a spit puts off there some distance.

The light-house on Cove Point contains a fixed light, varied by flashes, elevation 46 feet. It is a leading light, and *should be* seen soon after passing Point Lookout, coming up the bay, and from abreast of Sharp's Island going down. *Light.*

HOLLAND'S ISLANDS.—On the North side of Kedge's Straits are several islands, extending to Hooper's Straits, called under the above name. The Southernmost one is properly Holland's Island, and has two poplars on its Southern extremity. The next in order on the bay is Long Island, on the Northern end of which are some cedars; it stands out to the West more than any of the others. Bloodworth's is the largest and most Northerly of these islands; it forms the South side of Hooper's Straits, and is mostly marsh, with some hummocks of trees on it. On the East of these are several other small islands, which, with the Tangier Islands, make the Western boundary of Tangier Sound. A sand-spit or bar puts off from the S.W. of Holland's Island, which vessels drawing only 4 feet water would clear on a N.W. course from Fog Point light. It is hard sand bottom, irregular, but you can avoid it by sounding. (See Kedge's Straits.) There are no passages through these islands, and the flats extend out from them on all sides. *Holland's Islands.*

HOOPER'S STRAITS.—A light-vessel has been moored in Hooper's Straits, in 2½ fathoms water. It is necessary to lead vessels clear of the flat off Hooper's Island on the N., and those extending from off Bloodworth's Island on the South side of the passage. It is of service to vessels bound either to Nanticoke River or to Tangier Sound. In thick weather, by night or day, a bell will be rung on board at short intervals, and if it is thick and blowing, it is ordered to be constantly kept ringing. It is painted lead color, and shows one light, 30 feet above the sea. *Hooper's Straits.*

If from up the bay, and bound through the straits, bring the light-vessel to bear E. by N., and run for it, which course will carry you across Hooper's Island bar, in about 4 fathoms water; continue your course until you deepen your water into 7 fathoms, then steer E.N.E. until the light bears E., and run for it; or you may bring the vessel to E.N.E., and run directly for it; pass on your starboard hand, which will carry you into channel-way; continue your course after you pass the light-vessel E. and E. by S., towards Bishop's Head, keeping rather on the Northern side of the passage, and by showing a signal you can obtain a pilot to take you through Fishing Bay, Nanticoke River, or into Tangier Sound. The flats are steep to on both sides, and you can anchor opposite Todd's house, on Bishop's Head, in 3 fathoms water, about half a mile from the shore, the extreme S. point bearing S.E. by E., distant about three-fourths of a mile.

On the Northern side of the entrance to Hooper's Straits (on the Eastern side of Chesapeake Bay) is the sunken wreck of a schooner laden with coal. This wreck lies a little over one mile S. ½ W. (by compass) from Richland Point, and forms a dangerous obstruction, lying directly in the track of vessels bound into the Straits from the Northward. It lies in 17 feet water, bare on the bottom, (which is hard sand,) with 15 to 17 feet water alongside, and only 4 to 5 feet on it. A buoy has been placed on it by the Coast Survey. To avoid the wreck, (as also the shoal water to the Westward of Hooper's Island,) vessels bound into the Straits from the North should not approach Hooper's Island nearer than 2 miles, until the light-boat in Hooper's Straits bears (by compass) E. ½ N., in range with Bishop's Head.

If from down the bay, bring the light-vessel to bear N. E., and steer for it, when you will gradually shoalen your water on the South side; you may with safety course round the shoal in 3 fathoms until you bring the light to bear E., when you may steer as above.

To mark the entrance into the Sound through Hooper's Straits.

Buoy on outer wreck is in 4 fathoms water, and is painted black. *Buoys.*

Hooper's Straits buoy is in 14 feet water. This buoy is placed near to inner sunken wreck, and is painted black.

Light-vessel showing one light, abreast of entrance to Honga River. Bishop's Head buoy, No. 1, black, numbered on 4 sides, is in 15 feet water, soft bottom. From it Bishop's Head bears N. ½ W.; Bloodworth's Point, S. by E. ¾ E.; light-boat in Hooper's Straits, W. by N. ¾ N. This buoy is planted just at the entrance of Tangier Sound from Hooper's Straits. It is 20 feet in length, and must be left on the port hand.

Shark's Fin buoy, No. 2, red, numbered on 4 sides, is in 16 feet water. From it Clay Island light-house bears N.N.E.; Bishop's Head buoy, W. by N.; Deal's Island Point, S. by E. This being a turning point for Hooper's Straits, may also be considered as an entrance buoy to Tangier Sound. It is 20 feet in length, and must be left on the starboard hand in passing into the Sound from through the Straits. The bottom is soft mud.

BARREN ISLAND BAR.—N. by W., 25 miles from the light-vessel off Smith's Point, will carry you to the S. W. edge of this bar, which is very shoal, and extends *Barren Island Bar.*

off from the South end of the island about S.S.E., 4 miles. There is anchorage for small vessels on the Eastern side of it, but there is no passage between it and Hooper's Island. Barren Island may be known from the other islands by its being heavily timbered, and standing out more in the bay than either Hooper's or Taylor's Island. The bar is somewhat bold to, but serves well as a guide, bound up the bay, when you get soundings on that side, which is rather to be preferred, unless the wind is from the Westward.

Potomac River to Patuxent River. POTOMAC RIVER TO PATUXENT RIVER.—From Point Lookout, which is the Northern point of the Potomac River, 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. There is a light-house (the lantern being on the top of the dwelling-house) on this point, showing a fixed light.

Opposite to this point the flat of Upper Tangier or Smith's Island extends so far to the Westward as to narrow the channel of the Chesapeake to about 6 miles. This part of the flat is steep, and has 10 fathoms close to it. About 2 leagues to the Northward of Point Lookout is Point No-Point, off which, 1½ mile from shore, lies a shoal, on which there are 18 feet water. It is steep to, having from 5 to 7 fathoms close to it. It is about 50 feet square.

Cedar Point is 3 leagues North-westerly from Point No-Point. It is low and sandy, with some bushes and scattering trees on it; the water is so bold to on the Northern side, that you cannot be too careful in approaching it in the night. It extends out into the bay, the shore line making a bend to the Westward, between that and Point No-Point, and if it is sufficiently clear to see the white beach at the distance of 100 yards, you can run with safety. You may keep in 7 or 8 fathoms between these points. On the North side of Cedar Point it is shoal, so that after passing it, if bound into the Patuxent, keep no nearer the shore than 5 fathoms.

Light-house. Cove Point lies about 5 miles to the Northward of Cedar Point. A light-house is erected on it, showing a fixed light, varied by flashes, 50 feet above the surface of the water; the point is low and sandy, extending out into the bay, so as to make this the narrowest part of the Chesapeake. Vessels of light draft of water can anchor close under the South side of Cove Point, secure from the Northerly winds, in 3 fathoms water; or you may anchor under the yellow cliffs secure from N.W. winds, in case you cannot get up the bay, in 4 or 5 fathoms.

Patuxent River. PATUXENT RIVER discharges itself into the bay between Cedar Point and Cove Point; it is easy of access, and Drum Point, which is its Northern point, lies N.W., 3 miles from Cedar Point. The first high land met in going up the bay is the "Red Cliffs," commencing on the Northern side of the entrance to this river. If you go into this river, give Cedar Point a small berth, and stand to the Northward until you have the river open, when you may stand for Drum Point, which is on your starboard hand. This is a low, sandy, bold point. After passing this point you can anchor opposite the first bank or bluff in 2½ or 3 fathoms, secure from all winds. In beating into this river, you may stand on the North side for the high red cliffs to 3 fathoms water, and to the South to 5 fathoms; in the channel you will have 7 fathoms. 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 the buildings come on with Drum Point you must tack, to avoid a spit that runs off the South side of the mouth of the river.

This is one of the most frequented harbors on the Chesapeake, and it is common with those who seek shelter here, waiting for a fair wind, to remain at anchor until daylight before getting under way, even when the flood makes early in the morning, and the wind is from the Eastward. You should always keep in mind the time lost in beating out into the bay; and if bound up the bay, by leaving on the latter part of the ebb-tide, you will have the whole flood to help you in passing between Cove Point and Tailor's Island.

If you should harbor in the Patuxent, when you come out, bound up the bay, give the high land on the Northern side of the river something of a berth, going into not less than 5 fathoms water, and do 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 nearly to Cove Point, which should be avoided.

Cove Point. FROM COVE POINT BOUND UP THE BAY.—That part of the bay opposite Cove Point is about 5 miles in width; the flood and ebb sets strong here; a fast-sailing vessel may beat through it.

When up with Cove Point, you may give it a berth of not less than one-quarter of a mile, and steer up mid-channel, N. by W., which will carry you up with the North end of Poplar Island: the distance is about 8 leagues. In running this course, you will have from 10 to 15 fathoms, and you pass Sharpe's Island on your starboard hand; when it bears E., you may have 18 fathoms, muddy bottom.

Light-house. On the North end of Sharp's Island is a light-house, the lantern on the keeper's dwelling, showing a fixed light, 41 feet above the sea. The island is about 2 miles

long, and well wooded on its North end. A spit puts off from the South point, and the shore is not bold to.

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 port 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 7 and 8 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.

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.

Poplar Island.

POPLAR ISLAND is about 2 miles in length, having timber on the Northern and S.E. parts; a spit puts off on the Southern part, and vessels may anchor S.W. from the island, secure from Northerly winds. The passage on the Eastern side is only for vessels drawing about 8 feet water.

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 afford a 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.

Thomas Point light-house.

In running N. and N.W. from Poplar Island for Annapolis Roads, you pass Thomas Point light, which is a fixed light, 63 feet above the sea, and in a S.E. direction lies a shoal, which should be avoided, as it is 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 port hand, three small islands, called the Sisters, lying below South River.

North of Poplar Island, 4 miles distant, is the South point of Kent Island; you may anchor under it, secure from all winds but the S.W.

To mark Chester River Eastern Shore, Md.

Buoys.

Love Point buoy, No. 2, red, numbered on 4 sides, is in 15½ feet water. From it Poplar Tree on Love Point bears S.W. ½ W.; Swan's Point, N. ½ E. The bottom is hard. The buoy is 20 feet in length, and must be left on the starboard hand passing in.

Rouge Island buoy, No. 1, black, numbered on 4 sides, is in 12 feet water. From it M'Cullester's or Long Point bears S.W.; Hell Point, N.E. by N.; Cockey Island, N. ½ W. The bottom is very hard. The buoy is 18 feet in length, and must be left on the port hand passing in. Rouge Island is under water, and cannot be seen at high tide.

Light-house.

Thomas' Point light is a fixed light, 63 feet above the sea; it is important to the navigation of Chesapeake Bay, and those bound for Annapolis Road.

Annapolis.

ANNAPOLIS.—Vessels bound into Annapolis Harbor from down the bay, should give Thomas' Point a berth of at least 2 miles, and not open the poplars at Whitehall Creek to the Westward of the trees on the Western end of Hackett's Point. This range will carry them clear of the shoals off Thomas' and Talley's Points, in 7 fathoms water. When off Thomas' Point steer N. ¼ W. by compass until the whole length of the River Severn is open, then haul in N.W. ½ N.; in this range pass to the Southward of the black buoy off Greenbury Point, and, when near the white buoy off Horn Point, haul up to the Northward towards Fort Madison, and anchor in 19 feet water, muddy bottom. Vessels drawing under 12 feet water can stand for the inner white buoy, or channel buoy, and anchor inside of it, in from 13 to 14 feet water, muddy bottom.

Greenbury Point light-house.

Vessels bound in from up the bay, should give Sandy Point a berth of at least a mile, and steer S.W. by S. by compass, in from 7 to 8 fathoms water, until the end of Greenbury Point (on which there is a fixed light, 50 feet above the sea) is in range with the State House, then haul in W. ½ S. until the river opens, when steer N. W. ½ N. on this range, as before directed.

Vessels making the Inner Roads for a harbor, can anchor in from 3 to 4 fathoms water, muddy bottom, with the poplar on Horn Point in range with the State House, and Talley's Point open with Thomas' Point light-house.

The best anchorage in the outer roads for large vessels of war is in 8 fathoms water, muddy bottom, with Poplar on Horn Point in range with the State House, and Thomas' Point light-house bearing S.W. ½ S. by compass. This anchorage is distant 4½ miles from the city of Annapolis. High-water 4h. 43m., rise 2 feet 6 inches.

Fort Madison is an old fort, on a high red bank, bearing from Horn Point buoy N. by W.

To mark the Channel into Annapolis and the Severn River.

Buoys. Talley's Point buoy, No. 1, black, numbered on 4 sides, is in 18 feet water. From it Thomas' Point bears S.W. ½ S.; Talley's Point, W.N.W.; Greenbury Point, N. N.W. Where the buoy is planted the bottom is hard. Oyster-beds around it. In running for Annapolis it must be left on the port hand. The bar makes off some distance from Talley's Point. The length of the buoy is 30 feet.

Hackett's Point buoy, No. 2, red, numbered on 4 sides, is in 15 feet water. From it Thomas' Point bears S.S.W.; Greenbury Point, W.N.W.; Hackett's Point, N. by E. The bottom is hard sand. The buoy is 25 feet in length, and must be left on the starboard hand passing in.

Horn Point buoy, No. 3, black, numbered on 4 sides, is in 15 feet water. From it Horn Point bears W.; Greenbury Point, E. by N. The bottom is hard sand. The buoy is 25 feet in length, and must be left on the port hand passing in.

Greenbury Point buoy, No. 4, red, numbered on 4 sides, is in 14 feet water. From it Talley's Point bears S.; Horn Point, W.N.W.; Greenbury Point, N. by W. The bottom is hard and sticky. The buoy is 20 feet in length, and must be left on the starboard hand passing in.

Mouth of Severn River buoy, black and white perpendicular stripes, is in 13 feet water. From it Horn Point bears S.; State House, W. by N.; Mud Fort, N.E. The bottom is of hard sand. The buoy is 20 feet in length, is a channel buoy, and can be passed on either side.

Baltimore. BALTIMORE.—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 in 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 Hawkins' 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 Hawkins' 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 port 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 the 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 spar buoy, which you may pass on either hand. When abreast of North Point light, steer away for the White Rocks, which you 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 sail's 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 points within a small sails' 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 port 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 port 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 2 fathoms, on each side of the channel, which are steep, and the channel between them not more than a quarter of a mile wide. *Seven feet.*

The Bodkin light is discontinued, and a fixed light, 43 feet above the sea, is placed on 7-foot knoll in its stead.

N. B. The old tower is left standing, and to it the above bearings refer. *The old light.*

The North Point lights serve to show vessels the direction through the Ship-channel, also through the Swash. *Light-houses.*

There are two white lights on North Point, bearing N. by W. ½ W. from the Bodkin. They are 33 and 42 feet above the sea, respectively.

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, further 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 port hand, when you will follow the directions previously given for vessels of heavy draught of water. (See Chart of Chesapeake.)

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 bottom around it, from which the Bodkin light-house bears N.W. by N. ½ N.; 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, 2 miles. A spar buoy, painted black, is placed on the Northern edge of it, and numbered on four sides.

A fixed light, 37 feet above the sea, is placed on Fort Carroll, in the Patapsco River.

There is a fixed light, 35 feet above the sea, on Lazaretto Point, North side of Baltimore Harbor. *Light.*

Rates of Pilotage.

American vessels pay	$3 00	down, and	$4 00	up, per foot.
Foreign " "	4 00	" "	4 33	" "

Buoys to mark the channel in Patapsco River, arranged in order as they are passed in entering.

Buoy on North Point Bar is red, No. 4, 21 feet long, and numbered on 4 sides. It is in 11 feet water, soft bottom. Sparrow's Point bears N.W. by N.; North Point, N. *Buoys.*

Fourteen Feet Bank buoy is red, No. 14, 21 feet long, and numbered on 4 sides. It is in 14 feet, hard bottom. Upper North Point light-house bears E. by N.; Sparrow's Point, N.W. by N.

Buoy of Rock Point is black, No. 5, 21 feet long, and numbered on 4 sides. It is in 11 feet, hard bottom. Hawkins' Point bears N.W. by W. ½ W.; White Rock, W. S.W.

Buoy on Rock Knoll is black with a white ring, No. 7, numbered on 4 sides, and 22 feet long. It is in 17 feet, soft bottom. This buoy is at the turning point. Hawkins' Point bears N.W. by W. ½ W.; Sparrow's Point, N.N.W.

Buoy in Upper Channel is painted black and white perpendicular stripes. It is 21 feet long, and is in 16 feet water, soft bottom. Sparrow's Point bears N.W. ½ N.; lower light-house, North Point, E.

Buoys.

Buoy on Sparrow's Point Knoll is red, No. 8, 22 feet long, and numbered on 4 sides. It is in 17 feet, sticky bottom. Hawkins' Point bears W.N.W.; Sparrow's Point, N. by E.

Buoy off Hawkins' Point is black, No. 9, 24 feet long, and numbered on 4 sides. It is in 21 feet, sticky bottom. Soller's Point bears N.E. by N. ½ N.; lower North Point light-house, E. by S. ½ S.

Buoy on Soller's Point Flats is red, No. 10, 20 feet long, and numbered on 4 sides. It is in 16 feet, hard gravelly bottom. Lower North Point light bears E. by S. ½ S.; Hawkins' Point, W. by S. ½ S.

Buoy in Lazaretto Bar is red, No. 12, 29 feet long, and numbered on 4 sides. It is in 4 fathoms, sticky bottom. Flagstaff on Fort M'Henry bears N.W. by W.; Lazaretto light-house, N.W. ½ W.

Buoy off Fort M'Henry is black, No. 11, 29 feet long, and numbered on 4 sides. It is in 21 feet, soft bottom. Flagstaff on Fort M'Henry bears S.W. by W. ½ W.; Lazaretto light-house, S.E. ½ E.

To mark the entrance to and through Bodkin Swash.

Buoys.

Buoy off Magothy Shoal is black, No. 19, 21 feet long, and numbered on 4 sides. It is in 12½ feet, hard bottom. Lower Magothy bluff bears S.W. by W. ½ W.

Buoy on Belvidere Shoal is red, No. 20, 20 feet long, and numbered on 4 sides. It is in 10 feet, hard bottom. Vessels bound up the bay leave this buoy on the port hand; bound up the Swash, leave it on the starboard hand. Love Point bears S.E. ½ E.; Sand Point, S. ¾ E.

Buoy on S.E. Bodkin Bar is black, No. 1, 21 feet long, and numbered on 4 sides. It is in 16 feet, hard bottom. Sandy Point bears S. ½ E.; lower North Point light, N.N.W.

Buoy on N.E. Bodkin Bar is black, No. 3, 22 feet long, and numbered on 4 sides. It is in 15 feet, soft bottom. Rock Point bears W.; North Point, N.W. by N. ½ N.

To mark Pool's Island, and above.

Buoys.

S.W. Bar buoy, off Pool's Island, No. 1, black, numbered on 4 sides, is in 12 water. From it S.W. point Pool's Island bears N.N.E.; North point, S.W. by W. ½ W.; Swan's Point, S. ½ W. The bottom is of hard sand. The buoy is 18 feet in length, and must be left on the port hand passing up the bay.

S.E. Knoll, or Shark's Fin buoy, No. 2, red, numbered on 4 sides, is in 10 feet water. From it N.E. end of Pool's Island bears N.W. by N. ½ N.; S.W. end of Pool's Island, W. by S. ½ S.; Wharton's Point, N.E. The bottom is hard sand. The buoy is 18 feet in length, and must be left on the starboard hand passing up the bay.

N.E. Bar buoy, No. 3, black, numbered on 4 sides, is in 10 feet water. From it S.W. end Pool's Island bears W. by S. ½ S.; Wharton's Point, N.E. ½ E.; Swan's Point, S. by W. ¼ W. The bottom is hard. The length of the buoy is 18 feet, and it must be left on the port hand passing up the bay.

Wharton's Point buoy, No. 4, red, numbered on 4 sides, is in 16 feet water. From it High Tree, on Wharton's Point, bears S.E. by S.; point on the W. side of Still Pond Cove, E. by N.; Pool's Island light-house, S.W. by W. The bottom is hard. The length of the buoy is 25 feet, and it must be left on the starboard hand passing up the bay.

In coming up, red buoys with even numbers must be left on the starboard hand; black buoys with odd numbers must be left on the port hand. Buoys with white and black perpendicular stripes are in mid-channel, and may be passed on either hand; and buoys with red and black stripes have channel-ways on either side of them. Bearings are magnetic. Variation, in 1850, 3° W.

Buoys on Chessenessix and Occahonnock Creeks, on the Eastern Shore of the Chesapeake.

Buoys.

Three spar buoys have been planted to mark the entrance to Chessenessix or Chesconessix Creek, viz.: one on Big Island Bar, painted black, No. 1. Depth of water, at low spring-tide, 11 feet, hard bottom. Bearings per compass: Watts' Island light-house, N.W. ½ W.; Rogue's Island Point, N. by E.

One on Scott's Hall bar, painted red, No. 2. Depth of water, at low spring-tide, 12½ feet, hard bottom. Bearings per compass: Rogue's Island Point, N. by E. ½ E.; Watts' Island light-house, N.W. ¾ W.

One on Burrick's bar, red, No. 4, in 13 feet water. Crab Hummock Bluff pines bear S.W.; Burrick's Bluff, S.S.W.

Two spar buoys have been planted to mark the entrance of the *North channel* leading into Occahonnock Creek, viz.: one on the West end of Trout Hole Bar, painted

black, No. 1. Depth of water, at low spring-tide, 10 feet, hard bottom. Bearings per compass: Old John's Bluff, E. by N.; Battle Point, S. by E.

One on Sandy Point Bar, painted red, No. 2. Depth of water, at low spring-tide, 5 feet, hard bottom. Bearings per compass: Old John's Bluff, E. by N. ½ N.; Battle Point S. by E.

Directions for coming out of the Susquehanna 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 of Specutia Island, until you just shut in 2 Lombardy poplars, or till you get Turkey Point and a gap in the Highlands, South side of Elk River, to range; run 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.

Concord light, at Havre de Grace, is a fixed light, 40 feet above the sea, 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. *Light-house.*

On Poole Island is a light-house, containing a fixed light, 35 feet above the sea; 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. A bell is tolled in thick weather. *Light-house.*

On Turkey Point there is a fixed light, 65 feet above the sea. *Light.*

On Fishing or Donoho's Battery there is a fixed light, 36 feet above the sea. *Light.*

CAPE HENRY TO CAPE HATTERAS.

CAPE HATTERAS.—This cape lies about S. 13½° E., 103 miles from Cape Henry. From Cape Henry the coast trends about S. 13° E., and is safe of approach to within a mile, until off False Cape, 20 miles from Cape Henry light. East of False Cape, 1¾ mile distant, there is a shoal of 15 feet. South of False Cape 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, on which are 3 and 4½ fathoms water, and which consist of 3 ridges parallel to the coast of North Carolina, lying E.S.E. from the Northern part of the Woodlands on Chicomico, and distant from 1¾ to 3½ nautical miles from the beacon, the soundings are very irregular, changing sometimes 2¼ fathoms in a cast of the lead, with coarse sand, gravel, and shells on the shoals, and outside in 13 fathoms, soft black mud. Vessels of considerable draught should not approach the land here within 4 miles: there is generally a strong current setting towards the shore, and the water shoals very suddenly. 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.* *Wimble Shoals.*

There is a current with a South wind which runs N.N.E. 2 miles per hour, and with a North wind S.S.W. 2 miles per hour.

W.S.W. from Cape Hatteras, 8 leagues distant, is Ocracoke 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 about 8 o'clock, and the tide flows from 4 to 5 feet, being governed by the winds in the offing; in Easterly gales it runs several feet higher. *High-water.*

BODY'S ISLAND LIGHT is a Fresnel white light, of the fourth order, varied by alternate red and white flashes, 65 feet above the level of the sea. It bears from Cape Henry light S. 18° E., distant 70 miles; from Cape Hatteras light, N. 3° W., distant 33 miles, and is in latitude 35° 47′ 20″ N., longitude 75° 31′ 20″ W. *Body's Island light.*

CAPE HATTERAS LIGHT is a first order Fresnel flashing white light, about 150 feet above the level of the sea, which should be visible, under favorable circumstances, *Cape Hatteras light.*

from an elevation of 10 feet above the level of the sea, about 18½ nautical miles. The light-house is 1¼ mile from the point of the cape.

This light will be recognized, by observing that in every 20 seconds of time there will be an eclipse of 12 seconds duration, followed by a brilliant flash of 8 seconds duration—or in the same proportion, in every 15 seconds of time, there will be an eclipse of 9 seconds duration, followed by a brilliant flash of 6 seconds duration. Lat. 35° 15′ 11″ N., lon. 75° 30′ 33″ W.

A beacon is building on the Southern extremity of Cape Hatteras Point, which will exhibit a fixed light, 35 feet above the sea.

Cape Hatteras.

CAPE HATTERAS LIGHT.—Cape Hatteras light bears N. 37° W., distant about 8½ nautical miles from the South-eastern edge of the 9-feet or Outer Shoals. Magnetic variation, in 1850, 1° 30′ W.

To clear the Outer Shoals, in approaching them from the Northward and Eastward, bring the light-house to bear W., in 10 to 12 fathoms water, when run S., keeping in not less than 10 fathoms water, until the light-house bears N.W. ½ N., when any course South of West may be steered with safety.

In coming from the Southward and Westward, keep in not less than 10 fathoms water, until the light-house bears N.W., when any course Eastward of N. may be steered.

In bad weather, and especially at night, do not approach the Outer Shoals nearer than 15 fathoms water from the Northward and Eastward, and 12 to 11 fathoms from the Southward and Westward.

It is necessary to watch the bearings of the light-house, and keep the lead going in beating around or between the shoals. In approaching the shoals at night or in bad weather, if the light-house has not been seen before night, it will not be prudent to run for it.

As 10 or 11 fathoms water may be found to the Westward of the shoals, in going outside of them from the Southward and Westward, do not approach the land to the Southward of the cape nearer than 8½ to 10 miles.

To pass between the Diamond and Outer Shoals, from the Northward and Eastward, bring the light-house to bear W., in 10 to 9 fathoms water, about 4¼ miles from it, and run S. until the water shoals to 7 or 8 fathoms, and the light-house bearing N. W. ½ W., when run S.W., carrying not less than 4 fathoms through the channel, and deepening gradually to the South-western edge of it, until in 7 or 8 fathoms, with the light-house bearing North.

In approaching this channel from the Southward and Westward, bring the light-house to bear N., in 8 to 7 fathoms water, about 4¼ miles distant from it, and run N.E. until in 8 to 9 fathoms water, and the light-house bearing N.W., when the shoals will be cleared.

To pass between the Diamond and Cape Hatteras Spit from the Northward and Eastward, bring the light-house to bear N.W. by W. ½ W., in 8 to 7 fathoms water, 2½ miles distant, and steer S.W., giving the end of the spit and breakers a berth of half a mile. On this course not less than 3 fathoms will be found. When the light-house bears N., in 5 to 6 fathoms water, the Diamond will be cleared; and when the light-house bears N.N.E. ½ E., in 6 to 7 fathoms water, the Spit will be cleared, and the anchorage in the cove open.

To pass between the Diamond and the Spit from the Southward and Westward, bring the light-house to bear N., in 5 fathoms water, 2 miles from the breakers and point, and run N.E. until in 9 to 10 fathoms water, when the shoals will be cleared.

The bottom is hard sand with an occasional small spot of blue mud. The currents over and in the vicinity of the shoals have a velocity of 3 to 5 knots per hour, and are greatly influenced in direction and force by the winds. The surface water of the Gulf Stream extends to within a short distance of the Outer Shoals, for some time after a continuation of Northerly and Easterly winds.

High-water.

Greatest rise and fall of tides at Hatteras Cove	5.3 feet
Mean " " " " "	3.2 "
Least " " " " "	2.2 "

Hatteras Cove & Inlet

HATTERAS COVE AND INLET are good harbors of refuge for small coasters.

HATTERAS COVE.—This anchorage affords protection from all winds except those from the Southward and Westward, being exposed from S. to W.N.W.

To enter from the Southward and Westward, bring Hatteras light to bear N. E. by N. ¾ N., and run for it. Anchor when in from 5 to 4½ fathoms water, muddy bottom, with the breakers on the S.W. spit bearing South.

To enter from the Northward and Eastward, giving Hatteras Point (which lies 2 miles S.S.W. of the light) a berth of half a mile, will carry you across the shoals in 3½ fathoms water. Bring the light to bear N.E. by N. ¾ N., and run for it. Anchor

when in from 5 to 4½ fathoms water, muddy bottom, with the breakers on the S.W. spit bearing S.

To go outside the shoals, keep in 12 fathoms water until the light bears N.N.W., then steer N.W. until the light bears N.E. by N. ¾ N., and steer in for the anchorage as before directed.

To beat in.—Vessels beating in, should go about on approaching the Western shore, or in standing towards the spit, on getting into less than 4 fathoms.

HATTERAS INLET bears S. 70° W., (W. by S. ¾ S.,) 12 miles distant from Cape Hatteras light-house. It is known by a low sand island, which was formerly a round hummock, covered with trees, on the East side of the entrance. *Hatteras Inlet.*

The breakers seldom extend entirely across the entrance, but at nearly all times make on each side, and between them lies the channel.

The bar should be approached from the Northward and Eastward. Keep in from 4 to 5 fathoms water, along the breakers, until up with the opening. The course in is N.W. by W., half a mile, keeping the Southern breakers aboard until well up with the point of beach on the Western side of the entrance; then steer E.N.E. for the low sand island (formerly the round hummock) on the Eastern side, and when up with the island, anchor with it close aboard and wait for a pilot.

The least water on the bar is 14 feet, at mean low-water. The mean rise and fall of tides is 2 feet

The tides and currents are much influenced by the winds: the ordinary velocity in the channel is 3 knots.

The bottom is hard sand, except a few sticky spots about the anchorage at the head of the channel.

The following list of buoys is arranged in regular order as they are passed in entering Hatteras Inlet.

Buoys.

Middle Ground buoy is a black cask	in	6 feet water.
False Channel " " spar, 16 feet long, No. 1,	in	9 "
2d False Channel buoy is a black spar, 15 feet long, No. 3	in	8 "
West Mount Swash buoy is a black spar, 15 feet long, No. 5	in	8 "
2d West Mount Swash buoy is a red spar, 15 feet long, No. 2	in	8 "
Channel buoy is a black and white striped cask	in	10 "
North-west Point Reef buoy is a red cask, No. 4	in	12 "

As the channel is constantly shifting, no permanent bearings can be given for these buoys. In entering from sea, leave the first 4 buoys on the port hand. No one should attempt to enter without a pilot, unless well acquainted, or obliged by stress of weather, in which case anchor between the first and third buoys, and wait for a pilot.

OCRACOKE LIGHT, about 23½ nautical miles to the Southward and Westward of Cape Hatteras light-house is a fixed white light, 75 feet above the level of the sea, and should be seen, under favorable circumstances, from an elevation of 10 feet above the level of the sea, about 13½ nautical miles. Lat. 35° 06′ 31″ 6 N., long. 75° 58′ 27″ 4 West. *Ocracoke Light-house.*

A light-vessel, with 2 lights, is moored inside of the bar, bearing from it N.N.W. *Lights.*

There is a lighted beacon on Beacon Island, which bears from the bar N.W.; it is 39 feet above the sea.

A floating light is stationed within the point of the 9-feet shoal, near Peache's Hole Swash. She is moored in 2 fathoms water, with the light on Ocracoke 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. She shows one light, 42 feet above the sea.

Vessels bound to Washington, from the S.W. end of Royal Shoal, on which is a light-boat, showing a light 43 feet above the sea, will make their course good N.W. by N., which will bring them up the main channel of Pamlico River, and will be within a quarter of a mile of the light. *Light-boat.*

A light-vessel is on the S.E. end of Brandt Island Shoal; she is painted straw-color, and shows one light, 45 feet above the sea.

On a point of land on the South side of Pamlico River, 35 miles below Washington, running into Pamlico Sound, is a fixed light, 37 feet above the level of the sea.

A floating light is also moored at the mouth of Neuse River, showing one light, 38 feet above the sea. 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 3 miles; Gum Thicket bearing S.W. ½ W.; Brandt 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. *Light.*

Light.

Harbor Island light-vessel, of 72 tons, is between Pamlico and Cone Sounds, and shows one light, 34 feet above the sea.

Long Shoal Point floating light is on the Eastern end of the shoal, and shows one light, 46 feet above the sea.

The following list of buoys in Ocracoke Inlet and Pamlico Sound, is arranged in order as they are passed by vessels entering.

Buoys.

Ocracoke bar buoy is a black and white striped cask, in 15 feet water, the light-vessel bearing N.W. by W.

Buoy at the mouth of Wallace's Channel is a black and red striped spar, 18 feet long, in 8 feet water, hard bottom, Beacon Island light-house bearing N.W. by N.; Ocracoke light-house, N.E. by E.

Buoy at the point of Gales' Island is a red spar, No. 2, 14 feet long, in 7 feet water, hard bottom, Ocracoke light-house bearing N.E. by E.; light vessel, S.E.

1st. Bulkhead buoy is a black spar, No. 1, 14 feet long, in 6½ feet water, hard bottom, Beacon Island light bearing S.E. by S.; Nine-foot Shoal light-vessel, N.E. by N.

2d. Bulkhead buoy is a black cask, No. 3, in 7 feet water, hard bottom, Ocracoke light bearing E.; Beacon Island light, S.S.W.

3d. Bulkhead buoy is a black cask, No. 5, in 7 feet water, hard bottom, Beacon Island light bearing S.; Ocracoke light, E. by N.

1st. South Channel buoy is a red spar, 14 feet long, No. 4, in 7 feet water, hard bottom; Nine-foot Shoal light-vessel bearing N.E. by E.; Ocracoke light, E. by S.

2d. South Channel buoy is a black spar, No. 7, 15 feet long, in 7 feet water, hard bottom, Nine-foot Shoal light-vessel bearing N.E; Ocracoke light, E. by S. ½ S.

3d. South Channel buoy is a red spar, No. 6, 15 feet long, in 7 feet water, hard bottom; Nine-foot Shoal light-vessel bearing E.N.E.; Royal Shoal light-vessel W.

Tobacco Point buoy is a red spar, No. 8, 12 feet long, in 7 feet water, hard bottom; North point of Ocracoke Island bearing E. by N.; Flounder Slue Rock, S. by W.

West Mouth Swash buoy is a red can, No. 10, in 7 feet water, hard bottom; Ocracoke light bearing N.E.; Beacon Island light, S.E. by S.

Eight-foot Shoal buoy is a black and white striped can, in 8 feet water, hard bottom; Beacon Island light bearing E.S.E.; Royal Shoal light-vessel, W. by S.

Albemarle Sound lights.

ALBEMARLE SOUND LIGHTS.—Roanoke Island floating light is at the North end of Croton Sound, and shows one light, 3 feet above the sea.

Wade's Point floating light, on the North side of Pastoquash River, shows one light.

Roanoke River floating light, off Walnut Point, shows one light, 41 feet above the sea.

Cape Lookout.

CAPE LOOKOUT.—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 104 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 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. Variation, in 1850, 0° 30′ 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.

Buoys &c., as they are passed in going from Pamlico Sound through Core Sound to Beaufort Harbor.

Harbor Island bar buoy is a red cask, No. 2, in 4½ feet water. *Buoys.*

Marshy Point buoy is a black spar, 12 feet long, white head, and numbered on 4 sides. It is placed in 7 feet water; Fort Macon light bearing W. by S., Lenoxville, N.

In entering the sound, leave buoy No. 2 on your starboard hand, at least 50 feet, and steer for Harbor Island light-vessel, leaving her on the port hand. The channel is principally marked by stakes.

BEAUFORT, NORTH CAROLINA.—This harbor is about 8½ miles W.N.W. per compass from the South Spit of Cape Lookout, and can be entered with the wind from all points except W. and N.W., carrying in 17 feet and 3¼ fathoms, low-water neap. *Beaufort, North Carolina.*

On making Fort Macon, the breakers on each side of the entrance will be distinctly seen; enter midway between the breakers, or with the last Western hillock on Shackelford Point 1° 28′ open to the left of Fort Macon; and, if flood-tide, approach without fear the Western or Bar breakers, steering W. by N. ¼ N., per compass, 1¾ mile, or until the extreme N.W. hillock on Shackelford Point is about 2 oars' length open to the left, or Westward of a slim white spire in Beaufort. Then steer N.W. ½ N., following the bar breakers until Beaufort spire bears N. 2° 28′ E., when haul up N.W. by N. ¾ N., rounding Point Macon in 6, 7, 5, and 4 fathoms water, and anchoring off the wharf in 3½ fathoms, good holding-ground, mud and sand.

Entering on the ebb, give the bar breakers more of a berth than when flood. The ebb sets stronger through mid-channel, yet with considerable force over the bar. The flood over the bar sets strong to the Northward, and is apt to carry a vessel on the Middle Ground. In leaving, the same precautions are to be observed.

Should a vessel get ashore on the Middle Ground, if ebb, carry out a bower anchor with long scope to channel without delay, for on the flood nothing can be done on account of the swell and strong current; moreover, with the flood, the sand is all alive on the Middle Ground, and will not hold the anchor. If grounding on the flood, wind the vessel, if practicable, and let go an anchor to keep head to channel, as nothing further can be accomplished until the tide slackens.

There is a fixed light on a tower about 200 yards behind Fort Macon. The tower is of red brick, and the light is about 50 feet above the mean level of the sea. *Light.*

There is a beacon-light near the beach, one-quarter of a mile from the tower above mentioned, the 2 lights ranging with the outer buoy of the main bar, bearing S. 49° 45′ E. magnetic. The beacon-light is 30 feet above the sea, and is visible in the direction of the bar, about 10 nautical miles.

This harbor is of easy access, and affords perfect shelter from all winds.

Buoys as they are passed entering Beaufort Harbor from seaward.

Outer bar buoy is a black and white striped iron nun, in 31½ feet water, Fort Macon light bearing N.W. ¼ W. *Buoys.*

Bar buoy is a black iron can, No. 1, in 14 feet water; inner bar buoy bearing N.W. ¾ W.; Fort Macon light, N.W. ¼ W.

Inner bar buoy is a black and white striped iron can, in 22½ feet water, Fort Macon light bearing N.W. ¼ N.; Hillock, on Shackelford Bank, N. ¾ W.

Buoy on N.W. end of Shackelford Bank is a red spar, No. 2, in 10 feet water, Fort Macon light bearing N.W. ½ W.; inside bar buoy, S.E. ¾ S.

Middle Ground buoy is a red spar, No. 4, in 14 feet water, between Fort Macon and Bird Island Shoal; Fort Macon light bearing S.W. by W.; beacon, W. by S. ¾ S.

When up with the outer buoy, steer N.W. by W., to the inside bar buoy, leaving the bar buoy on the port hand, then steer N.W. ½ N., until nearly up with the buoy on West end of Shackelford Bank, when a N.N.W. ½ W. course will lead to the anchorage inside of Macon Point.

Pilots can be obtained by setting a signal at the fore. Vessels should heave to off the S.E. Spit, in 4 fathoms, convenient for entering when boarded by the pilot.

The Slue should never be attempted by strangers. Nine feet at low-water neap can be carried in the channel, winding near to the beach on Macon Point. High-water 7h. 46m., rise 2 feet 9 inches.

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. High-water 7h. 46m., rise 3 feet.

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 New Inlet, will carry you into 15 fathoms, South from the Fryingpan Shoals.

Cape Fear light-house. CAPE FEAR, or BALD HEAD LIGHT-HOUSE.—On the S.W. end of Smith's Island, Bald Head light-house is erected. It stands one mile from the sea, is 90 feet high, and contains a fixed light. The lamps are 107 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 1½ mile. On the bar, at high-tide, you have 14½ feet, and its rise is 5 feet. From the point of the cape the light-house bears N.W., distant 4 miles, and from the extremity of the Fryingpan Shoal, N.W. by N. ½ N., 5 leagues.

Light-ship. A light-ship is placed on the outer end of Fryingpan Shoal, in 10 fathoms water, painted yellow, and showing 2 lights, 40 feet above the sea.

Federal Point light. FEDERAL POINT LIGHT is a fixed light, 46 feet above the sea, and should be visible about 12 miles.

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 Roman Shoal, is S.W., and distance 72 miles. In approaching the coast, in 33° 20′, your first sounding 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 gray 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 in the direction of the coast to the Eastward, and when the Southerly winds cease blowing, they change suddenly to the contrary direction, which is a sure precursor of a N.E. wind.

Light-house. 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.

North Bar New Inlet. NORTH BAR 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.

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.

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 aprearance of a distant sail. As you approach the light, the water becomes gradually shoal. In 4 to 5 fathoms water, 1½ mile from the light-house, bearing W.S.W. to W., there is good anchorage, soft bottom. *Old Bar at New Inlet.*

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 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 port bow, which you will pass, leaving it on the port hand; as soon you leave the buoy, steer N.W., or keep the breakers close on board the port 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 high water, 14½ feet; and the sea is scarcely ever so rough as to prevent a pilot's boarding a vessel at the buoy. *The Main Bar of Cape Fear River.*

FEDERAL POINT LIGHT is a fixed light, 46 feet above the sea, and should be visible about 12 miles. *Federal Point light*

Buoys as they are passed in entering Cape Fear River.

Eastern outer slue buoy is a red iron can, in 24 feet water, Federal Point light bearing N. ½ W.; light-ship, S.S.E. *Buoys.*

Western outer slue buoy is a red iron can, in 21 feet water, Bald Head light bearing N. by W. ½ W.; light-ship, S.E. ½ S.

Eastern inner slue buoy is a red iron nun, in 26 feet water, Bald Head light bearing N.W. ½ N.; Federal Point light, N. ¼ W.

Western inner slue buoy is a red iron nun, in 24 feet water, Bald Head light bearing N. by W. ¼ W.; Western outer slue buoy, S.S.E.

Entering the slue from the Eastward, the above buoys must all be left on the starboard hand.

Western or Main bar buoys.

A red iron conical buoy, No. 2, on the bar, in 9 feet water, Oak Island lights bearing N.E. ¼ N.; Bald Head light, E. by S. *Buoys.*

A red can buoy, No. 4, on Battery Island shoal, in 14 feet water, Bald Head light bearing S.E. by S. ½ S.; Fort Johnson flagstaff, N. ½ E.

A black iron nun buoy, No. 1, on the point of shoal below the Horse-shoe, in 11 feet water, Bald Head light bearing S. by W. ¼ W.; Price's Creek outer beacon, W. ½ N.

Two beacons (fixed lights) at Price's Creek: front one on a tower, rear one on keeper's dwelling. They are arranged for Horse-shoe channel.

Horse-shoe Shoal light-vessel, one light, 43 feet above the sea, Bald Head light bearing S.W. by S. ¾ S.; Price's Creek outer beacon, W. ¾ S.: she is in 10 feet water.

A black iron conical buoy, No. 3, on lower part of Horse-shoe Shoal, in 6 feet water, Bald Head light bearing S. by W. ½ W.; Federal Point light, N. E. by E.

A black iron conical buoy, No. 5, on upper end of Horse-shoe Shoal, in 11 feet water, Bald Head light bearing S.S.W.; Federal Point light, N. E. by E.

A red iron nun buoy on New Inlet Rip, in 6½ feet water, Zeke Island wharf bearing N.E. by E. ½ E.; Federal Point light, N.E. ½ E.

A red iron can buoy, No. 8, on Drum Shoal, in 12 feet water, Federal Point light bearing S.E. ¾ E.; Orton's Point light, N.

A black oil-cask, No. 7, on Wreck Shoal, in 8 feet water, Campbell's Island light bearing S. by W.; Cower's Jetty, N.W.

A black oil-cask, No. 9, on the Middle Ground, in 8 feet water, Campbell's Island light bearing S. ½ E.; Cower's Jetty, N.W.

A red oil-cask, No. 10, on the Middle Ground, in 9 feet water, Campbell's Island light bearing S.S.E.; Cower's Jetty, S.

A red iron can buoy, No. 12, on the Bulkhead, in 9 feet water, Water's Point Jetty bearing N.W. by N.; Chimney of Water's Mill, W.

New Inlet buoys.

Buoys. Outer bar buoy is a black iron nun, No. 1, in 12 feet water, Federal Point light bearing W. by N.

Inner bar buoy is a black oil-cask, No. 3, in 12 feet water, Federal Point light bearing, W. ½ N.

NOTE.—Red buoys with even numbers must be left on the starboard hand entering, black with odd numbers must be left on the port hand.

Oak Island. On OAK ISLAND there are 2 fixed lights, 27 and 37 feet above the sea, which range N.E. by N. and S.W. by S. To run in, bring Bald Head light to bear E. or E. by N.; then run for it until the beacons on Oak Island range, thence the course is E. N.E. to the Rip. At the Eastern point of the Rip there are 7½ feet, on the Western Bar 7 feet. *High-water.* High-water about 7h. 30m., rise about 4 feet. Variation, in 1850, 1° E.

Other lights in Cape Fear River are:

Lights. Two fixed lights at Price's Creek, 25 and 35 feet above the sea.

A light-vessel on the Horse-shoe Shoal, between Price's Creek and New Inlet, painted yellow, one light.

A fixed light, 25 feet above the sea, on S.W. end of Campbell's Island.

A fixed light at Orton's Point, 25 feet above the sea.

Two fixed lights at Upper Jetty, 3 miles below Wilmington, 42 and 65 feet above the sea.

Georgetown. GEORGETOWN.—Georgetown entrance is 72 miles S.W. ¼ W. from Cape Fear.

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.

On your course towards Georgetown, several other inlets may be seen, and you pass North Inlet, about 3 leagues from Georgetown light-house; this inlet is the Northern boundary of North Island. 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, 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 2 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. Light. GEORGETOWN HARBOR.—Georgetown light-house is a white tower, erected on North Island, which is on the Northern and Eastern side of the harbor, at the entrance of Winyaw Bay, on a low sandy spot, and exhibits a fixed light, 85 feet above the level of the sea at high-water, bearing N. ½ W. from the entrance of the bar, 6 miles distant. From the South-easternmost part of Cape Roman Shoals to the entrance of the bar, the course is N.N.E., and the distance 17½ miles.

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. S.S.E., 5½ miles from Georgetown light, there is a shoal bank with 7½ feet water.

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, to the third buoy, which is also in the channel, 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. *Buoys.*

The North inlet channel to 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. *High-water.*

Buoys as they are passed entering Georgetown Harbor by Battle Channel.

Outer buoy is a red iron can, No. 2, in 14 feet water ; the light-house bearing N.W. ½ W. ; Middle buoy, W.N.W. *Buoys.*

Middle buoy is a red iron can, No. 4, in 8 feet water, the light-house bearing N.W.; inner buoy, W. by N.

Inner buoy is a red iron can, No. 6, in 9 feet water, the light-house bearing N. ; outer point of South Island, S.W. ½ S.

Light-house spit buoy is a red oil cask, No. 8, in 10 feet water, the light-house bearing N. ; inner buoy of Battle Channel, E. ½ S.

South-east Pass buoys.

Outer buoy is a wooden conical buoy, black and white stripes, "S.E. Pass" in white letters, in 17 feet water, light-house bearing N. by W. ¾ W. ; middle buoy, N.W. ½ N. *Buoys.*

Middle buoy is a black iron nun, No. 1, in 8 feet water, light-house N. by W. ¼ W. ; inner or North-east buoy, N.W.

Inner or N.E. buoy is a black iron nun, in 7 feet water, light-house bearing N. by W. ; survey beacon, South Island, W.

Middle Ground buoy is an oil-cask, black and red stripes, in 9 feet water. This buoy is on the lower point of the Middle Ground.

Buoy on Hance's Bank is a red oil-cask, No. 10, in 9 feet water.

Sampit Point buoy is black, No. 5, in 11 feet water.

Fort Point beacon is composed of 3 piles, boarded and white-washed.

Middle Ground buoy is an oil-cask, black and red stripes, moored on the shoal at the junction of Pedee and Wacamaw Rivers.

CAPE ROMAN LIGHT is a fixed light, 87½ feet above the sea ; the light-house is painted alternately black and white, beginning with white at the base ; it is on the East end of the Great Racoon Key, and bears W. by S. from Cape Roman. *Cape Roman light.*

A brick tower, to exhibit a first order revolving light, is building at Cape Roman. When finished, the present one will be discontinued, and Charleston light will be changed to a fixed light.

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. *Cape Roman.*

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,

There is a nun-buoy, black and white perpendicular stripes, and a black flag on staff, in 15 feet low water, in the Slue Channel, Cape Roman Shoals, Cape Roman light bearing N.W. by W. ½ W. ; North Point of Cape Island, N.W. by N. This buoy must be passed close to on either side. Courses from buoy out of the Slue, S.W. by W. and N.E. by E.

From the South entrance of Santee River, to 6 miles S.E. of Cape Roman, the shoal extends to a considerable distance from the land ; the S.E. point of it lies 17½ miles S.S.W. from Georgetown light-house. Close to this shoal there are 4 and 3 fathoms, and the land is so low that you cannot see it from the deck of a ship, at the extremity of the shoal.

In steering W.N.W. from the S.W. part of Cape Roman Shoal, you will soon see the light, then 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 not approach nearer to this bank than 5 fathoms water.

Georgetown, (S. C.) to Charleston, (S.C.)

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. distance 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.

Bull's Bay.

BULL'S BAY is about 23 miles North-east of Charleston light. On the North end of Bull's Island there is a fixed light, 35 feet above the sea. Bring the light-house to bear N.W. ¼ W., by compass, and run for it until over the bar, then follow the beach round by the lead, until the point of the island gives you a harbor. This course will give you not less than 9 feet at the bar at low-tide. Rise of tide about 6 feet.

Light-house.

Charleston light-house, which is 125½ feet above the sea, is built on Light-house Island, and contains a revolving-light: it will be changed to a fixed light when Cape Roman new light-house is finished.

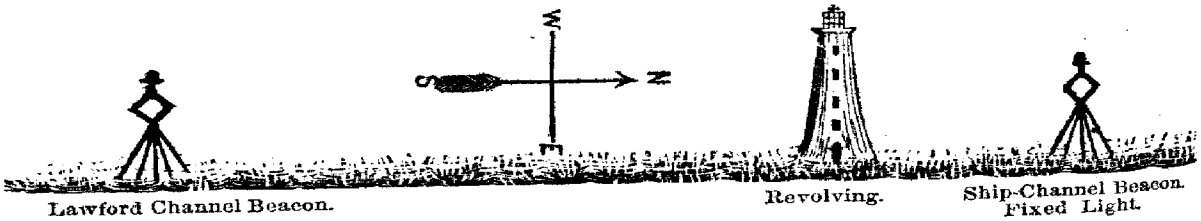
Buoy.

There is a can buoy, black and white perpendicular stripes, in 2½ fathoms, low-water, off the bar at Bull's Bay, North point of Bull's Island bearing N.W. by W.; Bull's light, W.N.W.; South point of Racoon Key, N.W. by N. ¼ N. This buoy must be passed close to on either side.

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, either side of which you may go when running in.

High-water.

There are 2 beacons on Sullivan's Island, 45 and 50 feet above the sea, as a range for the Ship-Channel. High-water 7h. 15m., rise 6 feet.



Lawford Channel Beacon. Revolving. Ship-Channel Beacon. Fixed Light.

There is an iron bell-boat, painted black and white perpendicular stripes, anchored in 5¼ fathoms, outside of Charleston Bar. Charleston light and beacon in range bearing a little Northerly. A light-vessel is located 2½ miles S.E. of Rattle Snake Shoals; it has 2 lights. Outer bar of North Channel bears W., 4½ miles distant; Fort Moultrie, 6½ miles distant; nearest land, 4 miles.

Charleston, (S. C.) Ship-channel.

CHARLESTON, (S. C.)—SHIP-CHANNEL.—Standing in for the Bar, having the beacon to appear as above, a handspike's length to the N. of the light-house, 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 2 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, keeping the 2 beacons on Sullivan's Island in range until you are up with the buoy off Cummin's Point, which you leave on your port hand. From Cummin's Point buoy the course is N.W. by N. to the anchorage in Rebellion Roads. When midway 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 port 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 light-house about three handspikes' length. Leave the buoy on the starboard hand at the distance of 50 yards, and then steer N. N.E. to clear the shoals on the port hand, until the light-house bears W.N.W., when the course should be directed to Sullivan's Island. *Lawford Channel.*

On Morris' Island are two white beacons, 40 and 55 feet above the sea, which kept in a 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 3 buoys in the NORTH CHANNEL. Run for the outer buoy, leaving it on the port hand; thence for the middle buoy, which leave on the starboard, and the inner on the port hand. Nearly the same water may be found in the North as in the Overall Channel. *N. Channel.*

There is a fixed light on Fort Sumpter, and one also on Castle Pinckney. *Light.*

Beacons, Buoys, &c., as they are passed entering Charleston Harbor.

Rattle Snake Shoal light-ship, white, 2 fixed lights, name on both sides in black letters; Charleston light bearing W. by S. ¾ S.; Fort Sumpter, W. ½ S.; moored in 33 feet water. *Beacons, Buoys, &c.*

Charleston light, white tower, 102 feet high.

Charleston beacon, white tower, 50 feet high.

This beacon, a little open N. of the light-house, gives the best water over the bar.

Bell-boat, one mast, with bell and 4 clappers, black and white stripes; Charleston light, N.W.; Overall outer beacon, N.W. by N. ½ N.; moored in 33 feet water.

Main Ship Channel Bar.

Outer buoy is a red iron nun, No. 2. in 20 feet water, just outside the bar, Charleston light bearing N.W. ½ N.; Overall outer beacon, N.N.W. *Buoys.*

Middle buoy is a red iron nun, No. 4, in 11 feet water, Charleston light bearing N.W. ¾ N.; Overall outer beacon, N.N.W.

Inner buoy is a red iron nun, No. 6, in 13 feet water, at the turning of the channel, Charleston light bearing N.W. ½ N.; Sullivan's Island outer beacon, N. ¼ W.

Channel buoy is an iron nun, black and white stripes, in 21 feet water, Charleston light bearing W. ½ N.; Overall outer beacon, N.W.

Sullivan's Island beacons are 2 white towers with fixed lights.

Cummin's Point buoy is a black iron conical buoy, No. 3, in 20 feet water, Sullivan's Island outer beacon bears N.E. ½ N.; Fort Johnston, W. by N.

Fort Sumpter beacon is a white tower, fixed light.

Lower Middle Ground beacon is an iron nun, black and red stripes, in 20 feet water, Fort Johnston bearing S.S.W.; Castle Pinckney, N.W. by W. ¼ W.

Upper Middle Ground buoy is a yellow iron nun, marked "Q," in 16 feet water, Fort Sumpter bearing E. by S. ½ S.; Fort Johnston, S.S.E.

Castle Pinckney beacon shows a fixed light.

Quarantine buoy is a yellow iron nun, marked "Quarantine," in black letters, Castle Pinckney bears N.; St. Michael's spire, N.W. by W.

White Point buoy is an iron conical buoy, black and red stripes, marked "White Point;" Bath House bears N.W. ½ W.; Castle Pinckney, N.E.

Overall Channel buoys.

Overall beacons are two fixed lights: one on tower, one on keeper's house; both white, and intended as ranges for Overall channel. The channel is constantly shifting, and should not be attempted without a pilot. *Buoys.*

Sunken bell-boat buoy is a wooden buoy, black and white stripes, in 21 feet water, Charleston light bearing W. by S. ½ S.; Overall outer beacon, W. ¼ S.

Outer buoy is a red iron can, No. 2, in 16 feet water, just outside the bar, Charleston light bearing W.S.W.; Sullivan Island outer beacon, N.W.

Middle buoy is a red iron nun, No. 4, in 9 feet water, on the edge of a new shoal, Charleston light bearing S.W. by W. ½ W.; Overall outer beacon, W. by S.

Inner buoy is a red wooden buoy, No. 6, in 10 feet water, Charleston light bearing S.W. by W.; Overall outer beacon, W. ½ S.

North Channel buoys.

Buoys. Outer buoy is an iron nun, black and white stripes, in 12 feet water on the bar, Charleston light bearing S.W. by W.; Fort Sumpter flagstaff, W. by N. ½ N.

Middle buoy is a red iron nun, No. 2, in 9 feet water, and is at the South edge of Drunken Dick Shoal, Charleston light bearing S.W. ½ W.; Fort Sumpter, W.N.W.

Inner buoy is a black iron nun, No. 1, in 15 feet water, Charleston light bearing S.W. ¼ S.; Fort Moultrie flagstaff, N.W.

Maffit's or Beach Channel buoys.

Buoys. Outer buoy is a black iron can, No. 1, in 15 feet water, on the Northern edge of Drunken Dick Shoal, Charleston light bearing S.W. by S. ¼ S.; Fort Sumpter flagstaff, W. ¾ S.

Middle buoy is a black iron can, No. 3, in 12 feet water, Fort Sumpter flagstaff bearing W.; Sullivan's Island outer beacon, N.

Inner buoy is a red iron can, No. 2, in 14 feet water, on the point of the breakwater, Fort Sumpter flagstaff bearing W. ¼ S.

Hog Island Channel buoys.

Buoys. Crab Bank buoy is a black iron nun, marked "C. B." in 16 feet water, Castle Pinckney bearing S.W. by W. ½ W.; Fort Sumpter, S.E. by S. ½ S.

Horse Creek Shoal buoy is a red iron nun, marked "H. C. S.," in 16 feet water, Castle Pinckney bearing S.W. ½ W.; Fort Sumpter, S.E. ½ S.

Shuetsfolly Point buoy is a black iron conical buoy, in 6 feet water, Castle Pinckney bearing S.S.E.; Ferry wharf, W. by S.

Sullivan's Island Cove.

Buoy. There is a red iron nun buoy, marked "S. I.," on the point of shoal running off from Sullivan's Island.

Stono Inlet. 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 it was not much frequented until Charleston was blockaded in the year 1775.

From 3 fathoms water, South of Charleston Bar to North Edisto 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 way to Edisto.

St. Helena Sound. ST. HELENA SOUND.—The entrance of this sound lies between South Edisto Island and the Northernmost Hunting Island; it is about two 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 Edisto, 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.

This Sound is a good place for shelter for vessels not drawing over 13 feet water. There are two channels, the Ship-channel, which has 14 feet, and the Slew channel, which has 9 feet at low-water. Time of high-water, at full and change, excepting during a freshet, 7h. 40m.; rise of tide about 7 feet.

High-water.

Light-ship. A light-ship, showing a fixed light, 30 feet above the sea, is moored inside the bar, excepting during 6 weeks in the summer, with the following bearings: North point of Hunting Island, W. ½ S.; the two Slew buoys, E. ½ N.; Ship-bar buoy, S.E. by S. A light-ship will be shortly placed at the entrance to Calibogue Sound.

To go in Slew channel, get the light-ship on with the North end of Hunting Island; it will then bear W. ¼ S.; run in until you are in 4 fathoms water, when you can haul up for Otter Island. On this bar there are two buoys, the outer one is white, in 2½ fathoms, the inner one is black, on the inside edge of the bar. They range with the light-ship as above mentioned. The best water is close to the North breaker, but the flood sets on it strong.

To go in by the Ship-channel, get a gap in the Southernmost Hunting Island to bear W.S.W., when you will have a bunch of woods that looks like an island over the centre of it; run for it until you get the sand point of the Northernmost Hunting Island to bear W.N.W., then run for the point until the light-ship or the S. point of Otter Island bears N.W. by N., when you will be in fair channel-way. You can then run for the point of Otter Island, inside of which there is a good harbor of 4 fathoms, muddy bottom; on the South end of the North breaker there is a black buoy, which bears S.E. by S., 2½ miles distant from the light-ship.

Beacons, Buoys, &c., as they are passed going into St. Helena Inlet and Sound.

Main Ship-channel buoys.

St. Helena light-ship is painted white, and shows one light, 20 feet above the sea; she is moored in 18 feet water, and is a guide for entering Slue Channel. North point of Hunting Island bears W.; North point of Otter Island, N.W. by N. *Buoys.*

Outer buoy is an iron can, painted black and white stripes, and is in 15 feet water. North point of Hunting Island bears W.N.W.; South point of Otter Island, N.W. ½ N.

Inner buoy is an iron nun, painted black and white stripes, and is in 20 feet water. North point of Hunting Island bearing W. by N. ½ N.; Inner point of Otter Island, N. W. by N.

Pelican Bank buoy is a black wooden buoy, No. 1, in 27 feet water, on the lower end of the bank, North point of Hunting Island bearing S. ½ W.; Morgan's Island, W. by N. ½ N.

Combahee Bank buoy is a wooden buoy, painted black and red stripes, and is in 11 feet water, on the lower end of the bank. North point of Hunting Island bears S. by E.; Morgan's Island, W. by N.

Slue Channel buoys.

Outer buoy is a large wooden buoy, painted black and white stripes, in 11 feet water, light-boat and North point of Hunting Island in range W. ½ N.; South point of Otter Island, N.W. ¾ W. *Buoys.*

Inner buoy is an iron can, painted black and white stripes, in 9 feet water, inside the bar, North point of Hunting Island bearing W. ¼ N.; Inner point of Otter Island, N.W. ½ N.

NORTH EDISTO HARBOR is 18 miles to the Southward and Westward of Charleston light, and 10 miles E.N.E. of St. Helena light-boat. The bar is 3½ miles from the shore, with 13 feet water on it at mean low-water. *N. Edisto.*

When in 4 fathoms water, with the woody clump of Seabrook Point, on the starboard side of the entrance, bearing N.W. by N., and Wilson's large white house open a quarter of a point to the Westward or port hand of Seabrook Point, steer in N.W. by N., keeping Wilson's house open as before directed. This course will carry a vessel near to the S.W. breakers, but by closing in the range of Wilson's house open with Seabrook Point slightly, when up to the breakers, the soundings will deepen. When in 8 fathoms water, steer N.W. ½ N., and when off the mouth of Bohicket Creek, N. W. by W. ¼ W., keeping in mid-channel until abreast of Legare's house; here anchor in 7 fathoms, muddy bottom.

No stranger should attempt to beat in, as the ground is broken, and the soundings frequently vary from from 3½ fathoms to 8 feet.

In entering on the flood the range and course must be closely watched, as the current sets towards the S.W. breakers, but in a strong breeze the breakers mark out distinctly the dangers to be avoided. Water may be obtained at Rockville.

On North Channel Bar is a black iron nun buoy, No. 1, in 10 feet water, which must be left on the port hand entering, Hartigan's Point bearing N.W. by W. ¼ W.; Townsend's signal, W. by N. *Buoys.*

East Channel Bar buoy is an iron can, painted black and white perpendicular stripes, in 16 feet water, Hartigan's Point bearing N.W ¾ W; Townsend's signal, W.N.W.

Bring Hartigan's Point in range with the point of low trees to the right of Legare's house, and run on this range for the harbor.

There is an iron nun buoy, painted black and white perpendicular stripes, on South Channel Bar, in 15 feet water, North point of Townsend's Island bearing N.W. by N.; Seabrook's signal, N. by W. Bring Seabrook's Point in range with Wilson's house at Bear Bluff, and cross the bar at the buoy. This range will take you close to the tail of Devos's Bank, but as you shoal your water haul to the Northward and Eastward until you close the house in half-way between it and the high woody point to the left of it, and then run for the middle of the harbor.

High-water. High-water, full and change, 7h. 10m. Spring tides rise 6.92 feet; neaps, 4.75.

S. Edisto. SOUTH EDISTO is 3 leagues W.S.W. from North Edisto. The shore of the islands which lie between them may be approached with your lead without danger. The shoalings towards it are gradual.

Port Royal. PORT ROYAL is 5 leagues N.E. ¼ E. from Tybee light-house, at the entrance of Savannah River.

Light-ship. A LIGHT-SHIP, showing 2 lights, 44 feet above the sea, in 7 fathoms water, has been moored between the S.E. point of Martin's Industry and the North bank of Port Royal entrance. Her hull is painted red.

Tybee light bears from it S.W. by W. ¾ W., about 12 miles distant; Bay Point, N. N.W., 10 miles; Hilton Head, N.W. by N., 8½ miles; outer buoy of Savannah bar, S. W. by W., about 12½ miles.

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 West 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. Michael'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 of 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 Phillip'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 Phillip'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 Phillip'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 Phillip'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. 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 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.

Tides. 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, at half-past 7 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.

S. Carolina. 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 seldom 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 towards 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.

Charleston Bar to Tybee.

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.

Tybee.

Tybee Island lies at the mouth of the 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 burden may lie in safety at anchor. Warsaw Sound is formed by the Southern end of this island.

Savannah.

SAVANNAH.—If in the night, and you are to the Northward of Tybee, be careful of going no 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.

TYBEE LIGHT is a fixed light, 108 feet above the sea, on the N.E. end of Tybee Island.

When in 4 fathoms water, outside the bar, bring Tybee beacon, which is on the point of the island, and shows one light, 62 feet above the sea, open to the Northward of Tybee light about the width of the light-house. This range will carry you near the outer buoy, No. 1, which must be passed on the starboard hand, leaving it to the Northward.

Lights.

Other lights in Savannah River are;

A light-vessel at Tybee Island Knoll, showing one light, 40 feet above the sea.

A beacon (fixed light) on a knoll off the Eastern end of Cockspur Island.

A beacon (fixed light) on the oyster-beds, to mark the South Channel.

A beacon (fixed light) on the Eastern end of Fig Island.

Buoy.

After passing the outer buoy, keep away to W. ½ S. by compass until Tybee beacon is open to the Northward of Tybee light, just midway between the light-house and the Martello Tower, and until buoy No. 2 (a red buoy) bears by compass N. by E., about a third of a mile distant. From here steer by compass N.W. by W. until Tybee beacon and Tybee light are in range, then by compass W. by N. ½ N.

If intending to anchor under Tybee Point, continue on the last given course until the light-house bears by compass S.W. by W., and the South point of Tybee Island is nearly shut in with the N.E. end of the island, then keep away by compass due West for the anchorage, from half to three-quarters of a mile, or until Tybee light bears from S. by E. to S.S.E., when anchor in from 4 to 5 fathoms, muddy bottom. By these courses, 3¼ fathoms at mean low-water, may be carried over the bar and up to the anchorage.

Buoys.

But if not intending to anchor here, follow on the W. by N. ½ N. course, leaving a black buoy (No. 3, at the end of the middle ground) on the port hand, and the next, a red buoy, (No. 4,) on the starboard. Having passed the latter, steer by compass W. ¼ S., keeping the light-boat a little on the port bow, and passing it to the Northward about 100 yards. Continue until the beacon off Fort Pulaski bears by compass S.W., nearly, when run for it, leaving a red buoy (No. 6) about 50 yards to the N.W. Deepening into 3¼ fathoms, at low-water, steer by compass W. by N. ½ N., until abreast of

Square beacon, when anchor in 3½ fathoms water. The shoalest water, 11 feet at mean low-water, will be found between the light-boat and buoy No. 6.

In beating over Savannah bar, when to the Eastward of buoy No. 2, be careful not to stand to the Northward until buoy No. 2 and Tybee light are in range, (it will be prudent to go about as soon as Square beacon opens to the Northward of Tybee Point,) as there is a bad shoal just to the Eastward of buoy No. 2. The Southern tacks can be continued (while East of buoy No. 2) until the light-house bears by compass W. ½ N. Having passed buoy No. 2, the port tacks can be kept on board until buoy No. 1 bears by compass E.S.E., and the starboard until Square beacon is open about two ships' length to the Northward of Tybee Point. The land will be a safe guide, as the soundings are regular in the fair channel-way, except just Eastward of buoy No. 2, and near Tybee Point. The Southern breakers should not be approached nearer than 3 fathoms water.

High-water. High-water, full and change, 7h. 1m. Spring tides rise 8.40 feet, neaps 5.58 feet.

Savannah affords great facilities to vessels in distress, there being a dry-dock capable of docking vessels 235 feet in length by 60 feet over all, and everything necessary for repairing vessels. There are also ways capable of drawing up vessels of 300 tons. There are 24 feet water on the bar at high-water, with a fall of 6 feet.

Vessels drawing 15 feet can proceed to the city at high-water. Those drawing 18 feet can anchor within two miles of the city.

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 burden.

Beacons, buoys, &c., as they are passed in entering Tybee Bay and Savannah River.

Martin's Industry light-vessel is painted red, with name on each bow, and shows 2 lights, 40 feet above the sea, and a red ball on each mast-head for day-marks. She is moored in 7 fathoms water, Tybee light bearing S.W. by W. ½ W.; North point of Hilton Head Island, N.W. by N.

Buoys. Outer bar buoy is a red iron can, No. 2, in 21 feet water, light-house bearing W. ¼ N.; South point Hilton Head Island, N. by W. ½ W.

Inner buoy is a red iron can, No. 4, in 17 feet water, light-house bearing W. by N.; South point of Hilton Head Island, N.N.W.

Spit buoy is a black iron conical buoy, No. 1, in 14 feet water, on the lower point of Cockspur Island Shoal, Tybee light bearing S. by E. ½ E.; Fort Pulaski flag-staff, W. by S.

St. Michael's buoy is a red iron conical buoy, No. 6, in 10 feet water, Tybee light bearing S.E. ½ S.; Fort Pulaski flagstaff, S.W. by W. ¾ W.

Lower Oyster-bed buoy is a black iron conical buoy, No. 3, in 12 feet water, Tybee light bearing S.E. by E.; Fort Pulaski flagstaff, S.W. by W. ½ W.

Knoll light-ship is painted black, and shows one light; she is anchored in 13 feet water, Tybee light bearing S.E. by E. ½ E.; Oyster-bed beacon, W. ½ N.

Upper Oyster-bed buoy is a red iron conical buoy, No. 8, in 14 feet water, Tybee light bearing E.S.E.; Oyster-bed beacon, W. by N.

Cockspur Channel beacon light is now in course of erection.

Lower Oyster-bed dumb beacon is a dark-colored brick tower.

Oyster-bed beacon light shows one red fixed light, and is painted white.

Upper Oyster-bed dumb beacon is a black brick tower.

Long Island beacon is a square wooden tower, painted black and white horizontal stripes.

Jones' Island beacon is a square wooden tower, painted red and black horizontal stripes.

Lower Elba Island beacon is a square wooden tower, painted red.

Upper Elba Island beacon is a square wooden tower, painted white.

Rock Point beacon is a square wooden tower, painted black.

Lower Wreck buoy is a red wooden can, No. 10, in 12 feet water, on the point of Hutchinson's Island shoal; Fig Island light bearing W. by S.; Daniel's Chimney, N.W. by N.

Upper Wreck buoy is a black iron can, No. 5, in 10 feet water, Fig Island light bearing W. ½ S.; Daniel's Chimney, N.W. by N. ½ N.

Warsaw. WARSAW has 10 feet on the bar, but it is too intricate for strangers.

The outer bar buoy is a red iron can, No. 2, in 13 feet water, Tybee beacon bearing N. by E. ½ E.; North point of Warsaw Island, W. by N. ½ N. Leave this buoy on the starboard hand close to, and steer N. W. by W. to red can buoy, No. 4, inside the

bar, in 20 feet water, which leave on the starboard hand, and haul up for the North point of Warsaw. The water is very bold near the island.

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. *Ogechee River.*

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 at 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. *St. Catharine's Bar.*

There is a red can buoy, No. 2, in 16 feet water, outside the bar at Beach Channel, inner point of St. Catharine's bearing S.W. by W. ½ W.; inner point of Ossabaw, W. by S. ½ S. Leave this buoy on the starboard hand, and steer S.W. by W., 2½ miles, to red iron can buoy, No. 4, inside the bar, in 10 feet water. *Buoys.*

Buoy No. 4 is on the point of shoal running from Ossabaw Island, and must be left on the starboard hand entering, inner point of St. Catharine's bearing S.W. by W.; inner point of Ossabaw, W. by S.

To go through Swash Channel, when up with the red sugar-loaf buoy on Northern edge of Bull Tongue Bank, in 10 feet water, (South end of Ossabaw bearing E.N.E., and North end of St. Catharine's S.E. by S.,) steer S. by W., making allowance for the tide, one mile, to the Southern buoy, (which is a large red nun buoy, with a white flag on staff.)

Both of the other buoys must be left on the starboard hand going South.

SAPELO INLET.—To enter Sapelo Inlet, get the outer beacon on St. Catharine's open about 3 handspikes' length to the North of the inner one, and steer nearly for the North end of Blackbeard Island, or W. ½ S., leaving both buoys on the port hand. Between the points of the islands the water is deep. *Sapelo Inlet.*

St. Catharine's beacons are 2 masts with large barrels on top. *Beacons.*

Outer bar buoy is a black can buoy, in 18 feet water, the beacons bearing W. ½ N.; outer one a little to the Northward of the inner, and Blackbeard Island North point, W. by S. *Buoys.*

Inner bar buoy, is a black can buoy in 20 feet water, beacons bearing W. by N.; North point of Blackbeard Island, W. ½ S.

DARIEN OR DOBOY LIGHT.—On the South point of Sapelo Island is a fixed light varied by flashes, 74 feet above the level of the sea. 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. *Darien or Doboy light.*

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; the rear one is black, 15 feet, and the front one white, 25 feet above the sea, both lighted.

DARIEN.—Vessels making the land, when in 5 or 6 fathoms water, will, during clear weather, see the beacons on Wolf Island. Keep in 5 fathoms water till the light-house bears N.W. by W. ¼ W., when the outer buoy, which is in 3 fathoms water, will be seen. Stand in W. ½ S., passing to the Northward of the buoy and near it; keep this course to clear the North Breaker head, till the black beacon opens to the Southward of the keeper's house; then haul up W.N.W. ½ W. for the middle buoy, passing it on either side, and steer N.W. ½ W. for the inner buoy, which leave on the port side, giving it a berth of 100 yards. When past the buoy, steer N.W. by W. ½ W., keeping in not less than 4 fathoms, to anchorage abreast of the light-house. The water shoals gradually on the South side of the channel, but on the North side the breakers are steep to. *Darien.*

Chimney Spit is bare at half-tide, and is a good guide to the anchorage.

Or you may, after making the light on Sapelo Island, and steering directly for the beacons on Wolf Island, bring them in a line, and keeping the lead constantly going, the light-house bearing W. ¼ N., (true,) cross the bar in 13 feet water. Neap tide ebbs 7 feet.

The following are the depths of water, bearings, and distances of the buoys placed in Doboy Inlet, leading to Darien, Georgia:

Outer bar buoy is an iron nun, painted black and white stripes, with a flag on a staff, in 17 feet water, just outside the bar, Sapelo light bearing N.W. by W. ¼ W., Wolf's Island beacon, W. ¾ N. *Buoys.*

Second bar buoy is a red iron nun, No. 2, with a white flag on a staff, in 13 feet water, on the South edge of North breaker. Give this buoy a berth of fifty yards, and leave it on the starboard hand entering. Wolf's Island beacons bear W. ¾ N.; Sapelo light, N.W. by W.

Third bar buoy is an iron nun, with a black flag on a staff, painted black and white stripes, in 17 feet water, Sapelo light bearing N.W. ¾ W.; Wolf's Island beacons, W. ¾ N.

Fourth bar buoy is a black iron nun, No. 1, with palmetto branches on a staff, in 18 feet water, near the outer edge of the Knuckle, Sapelo light bearing N.W. ¾ W.; Wolf's Island beacons, W. by S. ¼ S. Leave this buoy on the port hand, giving it a berth of 100 yards.

Tybee to St. Simons. TYBEE TO ST. SIMONS.—Bring Tybee light-house to bear N.W. when in 10 fathoms water, and steer S.W. by S., distant 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 latitude 31° 7′ N., and may be known by four trees standing thus † † † †. On the South side of that harbor lies Jeckyl Island, on which are remarkable trees, appearing like umbrellas, and thence called the umbrella-trees. St. Simon's and Jeckyl Island beaches are remarkably white. The bar at the entrance of St. Simon's Sound lies 6 miles from the light.

St. Simons. ST. SIMONS.—St. Simon's light is on the South point of St. Simon's Island; it is a fixed light, 80 feet above the sea.

St. Simon's Inlet and Sound. ST. SIMON'S INLET AND SOUND.—The buoys at St. Simon's Inlet and Sound are arranged in the following manner:

Outer bar buoy is a large first-class nun, painted red, with No. 2 in white, placed in 19 feet water at low-tide, and must be left on the starboard hand entering. St. Simon's light bears N.W. by W. ½ W.; North point of Jeckyl, W. by N. ½ N.

Middle buoy is a second-class nun, painted black, with No. 1 in white, placed in 16 feet water at low-tide, on the Eastern edge of the middle ground, and must be left on the port hand entering. St. Simon's light bears N.W. by W. ¼ W.; North point of Jeckyl, W. by N.

Inner buoy is a second class nun, painted black, with No. 3 in white, placed in 21 feet water at low-tide, on the point of shoal running off from Jeckyl Island, and must be left on the port hand entering. St. Simons' light bears N.E. by N. ½ N.; North point of Jeckyl, W. by S. ½ S.

In the Sound is the Lower Middle Ground buoy, a second-class nun, painted with red and black horizontal stripes, placed in 12 feet water at low-tide, on the lower point of the Middle Ground, to mark the two channels. St. Simon's light bears N. E. by E.; North point of Jeckyl, S.E. by S. ½ S.

Middle Middle Ground buoy is a second class nun, painted red, with No. 4 in white, placed in 18 feet water at low-tide, near the elbow of the Middle Ground, and must be left on the starboard hand entering. North point of Jeckyl bears N.E. ½ E.; Brunswick Point, W. by S.

Upper Middle Ground buoy is a second-class iron conical buoy, painted red, with No. 6 in white, placed in 18 feet water at low tide, near the upper end of the Middle Ground, and must be left on the starboard hand entering. Brunswick Point bears W. by S.; mouth of Jeckyl Creek, S. ½ E.

NOTE.—In running in for St. Simon's Bar, bring the light to bear N.W. by W. ½ W. while in 4 fathoms water. This bearing as a course will take you up to the Outer Bar buoy and into the sound, passing the buoys as directed.

Brunswick Bar. BRUNSWICK BAR has 14 feet at low-water; spring tides rise 8½ feet, neap tides 6 feet; high-water, full and change, 7h. 30m.

Light. LIGHT.—On the North end of Little Cumberland Island, on the Southern side of the entrance to St. Andrew's Sound, there is a fixed light, 70 feet above the sea. E. S.E. from the light, distant 8 miles, there are 11 feet water.

St. Andrew's Inlet and Sound. ST. ANDREWS'S INLET AND SOUND.—The buoys at St. Andrew's Inlet and Sound are arranged in the following manner:

Bar buoy is a second-class can, painted red, with the No. 2 in white, placed in 16 feet water at low-tide, and must be left on the starboard hand entering. Little Cumberland light bears W. by N. ½ N.; South Point of Jeckyl, N.W. by W.

Middle buo yis a second-class can, painted red, with No. 4 in white, placed in nineteen feet water at low-tide, near the high North Breakers, and must be left on the starboard hand entering. Cumberland light bears W. by N. ¼ N.; South Point of Jeckyl, N.W. ½ W.

Inner buoy is a second-class can, painted black, with No. 1 in white, placed in 21 feet water at low-tide, near a dry shoal, and must be left on the port hand entering. Cumberland light bears S.W. by W. ¼ W.; South Point of Jeckyl, N.W. ½ N.

In the Sound is the Middle Ground buoy, a second-class can, painted with red and black horizontal stripes, placed in 10 feet water at low-tide, on a point of shoal running down from the Satilla River, and nearly in the middle of the Sound. Vessels must not pass to the Westward of it. Cumberland light bears S. by E. ½ E.; inner point of Jeckyl, N.W. ½ N.

Buoy at the entrance of Satilla River is a second-class can, painted black, with No. 3 in white, placed in 10 feet water at low-tide, and must be left on the port hand entering the river. Cumberland light bears S. by E.; outer point of Jeckyl, N.E.

In running for St. Andrew's Bar give the land a berth of about 8 miles, until the light bears W. by N. ½ N., while in 4 fathoms water. This bearing, as a course, will bring you up to the bar buoy; then haul to the Northward until the middle buoy, No. 4, is in range with the light (to avoid 2 lumps in a direct line W. by N. ½ N. between the 2 buoys,) when steer for it, passing it to the Southward. From this buoy a N.W. by W. ½ W. course will take you into the Sound.

To run in by compass: keep in not less than 6 fathoms water, until the light-house bears as above, W. by N. ½ N., then steer for the light-house. When the South point of Jeckyl Island bears N.W. ½ W., steer N.W. by W. ¼ W., until the light-house bears W.S.W.; then haul in for the anchorage under the N.W. end of Little Cumberland Island, and anchor when convenient.

High-water, full and change, at light-house, 7h. 55m. Spring tides rise 7 feet. *High water*

Satilla River empties into St Andrew's Sound. Crow Harbor lies up Satilla River, about 30 miles, and is a great timber dépôt; about 15 miles above Crow Harbor is the town of Jefferson, where vessels drawing 12 feet can go.

ST. MARY'S.—On the North point of Amelia Island there is a revolving light, 104 feet above the sea. *St. Mary's.*

Bound into St. Mary's, keep in 6 fathoms water, until Amelia Island light bears S.W., then steer for it, keeping it in range with the South beacon until up with the entrance buoy, which may be passed on either hand. Buoys Nos. 1 and 3 should be left on the port hand, and No. 2 on the starboard hand.

Keep on this course until you bring the East and West beacons in range, then steer for them, (W. ¾ N.,) leaving buoy No. 4 on the starboard hand, until up with the inner buoy on Kingsley's Bank, which leave on the port hand.

When the light-house bears S.W. by S. ½ S. steer N.W. ½ W., until you bring the East beacon to bear S.W. ¼ S.; then run W. ½ S. until you open Amelia River; then steer in for it, keeping from 1½ to 2 cables' length from the Amelia shore. This will carry you into good anchorage.

Keeping the same distance from the Amelia shore will carry you up to Fernandina.

St. Mary's Inlet buoys are arranged as follows:

Bar buoy is a second-class iron nun, painted with black and white perpendicular stripes. This buoy is just outside the bar, in 24 feet water at low-tide, and can be passed on either hand; the light-house bears S.W., (the general course over the bar.)

Second buoy is a third-class iron can, painted black, with the No. 1 in white. This buoy is just inside the bar, in 13 feet water at low-tide, near the edge of the South Breakers, and must be left on the port hand entering.

Third buoy is a second-class iron nun, painted red, with No. 2 in white. This buoy is in 13 feet water low-tide, near the edge of the North Breakers, and must be left on the starboard hand entering.

Fourth buoy is a third-class iron can, painted black, with the No. 3 in white. This buoy is in 12 feet water at low-tide, near the edge of the South Breakers, and must be left on the port hand entering.

Fifth buoy is a second-class iron nun, painted red, with the No. 4 in white. This buoy is in 14 feet water at low-tide, near the inner point of the North Breakers, and must be left on the starboard hand entering.

Sixth buoy is a second-class iron nun, painted black, with the No. 5 in white. This buoy is in 18 feet water at low-tide, and is placed near the shoal running off from Amelia Island, and must be left on the port hand entering.

Seventh buoy is a second-class iron can, painted black, with the No. 7 in white. This buoy is in 16 feet water at low-tide, near the edge of Tiger Island Shoal, at the entrance of Fernandina River, and must be left on the port hand going to St. Mary's.

Eighth buoy is a second-class iron nun, painted with black and red horizontal stripes. This buoy is in 12 feet water at low-tide, and is placed on the point of shoal formed by the junction of St. Mary's and Cumberland Rivers.

Amelia Bar. AMELIA BAR has on it, at low-water, 14 feet. Spring tides rise 8½ feet; ordinary tides, 6 feet. The entrance to the bar is in latitude 30° 41′ 51″; the light-house is in 30° 40′ 32″.

Fernandina. FERNANDINA, the port of Amelia Island, is on the West side of the island, 1¼ mile South of the North point of the island. Vessels can anchor in the harbor in 40 feet water, sheltered from all winds.

The Florida Railroad Company have a wharf of 22 feet at low-water at this place.

Light. The light-house on Amelia Island is too far South for use, excepting to find the outer buoys of the bar.

Tides. Full sea at St. Mary's Bar, on full and change, at half-past 7 o'clock; average tide 7 feet.

St. John's light. ST. JOHN'S LIGHT is a fixed light, 65 feet above the sea, on the South side of the entrance to the river.

St. Mary's to St. John's. 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, 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. 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., within one 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 6 feet; neap tides not more than 4 feet. The currents run out until a 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.

Tides.
High-water.

Buoys in St. John's River.

Buoys. Outer buoy is a red wooden nun, No. 2, in 29 feet water, St. John's light bearing W. by S.; Pilot's Station, W. ½ S.

Bar buoy is a red iron conical buoy, No. 4, in 9½ feet water, light-house bearing W. by S. ¼ S.; Pilot's Station, W. ½ S.

Third buoy is a red iron conical buoy, No. 6, in 12 feet water, light-house bearing W. by S. ½ S.; Pilot's Station, W. ¼ S.

Fourth buoy is a red iron conical buoy, No. 8, in 14 feet water, light-house bearing W. by S. ½ S.; Pilot's Station, W.

Fifth buoy is a red iron conical buoy, No. 10, in 31 feet water, light-house bearing S.W. ½ W.; Pilot's Station, W. ¼ N.

Sixth buoy is a black iron nun, No. 1, in 12 feet water, light-house bearing S. by E. ¾ E.; Pilot's Station, W.

Dame's Point Middle Ground lower buoy, is a black iron nun, No. 3, in 13 feet water, Yellow Bluff bearing N.W. by W.; House on Dame's Point, N.N.W.

Spit buoy is a red iron nun, No. 12, in 13 feet water, Dame's Point bearing N.N.E.; Mitchell's house, S.S.W.

Middle Ground buoy is a black iron nun, No. 5, in 13 feet water, Dame's Point bearing E.N.E.; Mitchell's house, S. by W.

Upper Middle Ground buoy is a black iron conical buoy, No. 7, in 12 feet water, Broward's house bearing W.; Dame's Point, S.E.

Red buoys are to be left on the starboard hand entering, and black buoys on the port hand; striped buoys, pass on either side.

Nassau Inlet.

Buoys. Outer Buoy is a red iron nun, No. 2, in 24 feet water, North point of Talbot Island bearing W. by N.; St. John's light, S. by W.

Inner buoy is a red iron nun, No. 4, in 8 feet water, North end of Talbot Island bearing W. by N.; St. John's light, S. ¼ W.

St. John's and Nassau bars are constantly shifting, and should not be entered without a pilot. The buoys will always be placed so as to be left on the starboard hand entering.

The St. John's is a long and broad bay, which receives the impressions of the tide at more then 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 2

or 3 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 is on the North end of St. Anastasia Island, and is a fixed light varied by flashes. It is a square tower, painted white, 68 feet above the sea. *St. Augustine light.*

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. *Light-house.*

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 in the bar with a flag, and a wave to the right or left will indicate whether the vessel is to proceed either port 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.

Bar buoy is a red iron conical buoy, No. 2, in 21 feet water, St. Augustine light bearing W. ½ S.; Jack's Mount, S. by W. ½ W.

The inner buoy is a red wooden can, No. 4, in 8½ feet water, St. Augustine light bearing W. by N.; Jack's Mount, S.S.W.

Leave the above buoys on the starboard hand entering.

The tide flows, at full and change, S.E. by S. and N.W. by N., 8h. 4m. *Tide.*

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. *Mosquito 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 15 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 further 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 lat. 35° 15′ N., when it sets more Easterly, or about N.E by N., as far as lat. 37° N.; from thence, as far as the Capes of Delaware, its direction is about E.N.E., and from lat. 38° 57′ N. it sets nearly E.

To keep in the best current of the Gulf Stream, when in longitude 79° 30′, latitude 29° 30′, steer North until in lat. 30° 30′, thence N.N.E., Easterly, until up with Hatteras.

NOTE.—Along the Southern coast of America, you will find no tide further out from the shore than 10 or 12 fathoms water; from that depth until the edge of the soundings you will have a current setting to the Southward, at the rate of one mile *Note.*

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*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.

per hour: when out of soundings, you will have the Gulf Stream setting to the N.E. quarter, and the further 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.

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′, with a good breeze, to steer W.S.W., 25 leagues, and if at daylight Florida Reef is not in sight, steer 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 daylight, and at night haul out at a respectful distance, until fairly daylight 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 E. 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.

Beacon.
Buoy.

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.

Key Biscayno light.

A fixed light, 70 feet above the level of the sea, 400 yards from the beach, and about 7 miles from the Gulf Stream, is placed 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.

Turtle Harbor.

TURTLE HARBOR.—This harbor is 4½ miles to the Northward and Westward of Carysfort light-house, easy of access, and may become an important harbor of refuge if properly marked by a beacon and buoys. The depth of water at the entrance to the channel is 26 feet, and the light-house, from its proximity, assists in guiding to the anchorage, which is soft clay.

Carysfort light.

CARYSFORT LIGHT is a fixed light, 106 feet high, on the Eastern edge of the reef, in lat. 25° 13′ 15″ N., long. 80° 12′ 44″ W.

Sand Key light.

SAND KEY LIGHT is a Fresnel first-order fixed light, varied by flashes. The focal plane is 110 feet above the sea. From an elevation of 15 feet above the level of the sea, it should be seen at the distance of nearly 17 nautical miles. It is in lat. 24° 27′ 09″ 5 N., long. 81° 52′ 43″ 5 W.

A beacon is to be placed on the Rebecca Shoal, which will make the passage between the shoal and the Tortugas perfectly safe.

LIGHTS.—Since the organization of the Light-house Board the lights on the coast of Florida have been much improved, and shipmasters may run for them, by keeping a good look-out, without running ashore. *Lights.*

TORTUGAS LIGHT.—Fixed, 70 feet high, on Bush Key, lat. 24° 36′ 42″ N., long. 82° 54′ 00″ W. *Tortugas light.*

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. *Buoy.*

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. *Bahamas.*

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, Guannahan, 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 BANK, WITH ITS ISLANDS.—The Hole-in-the-wall, which is the Southernmost extreme of the Abaco Island, bears N.N.W. from Egg-Island, 7½ leagues distant, and the two form the mouth of what is called the North-east 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. *Little Bahama Bank, with its islands.*

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 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 Island is Burrows' Key.

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 there erected by the 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 extends 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.

Great Bahama Island.

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.

Little Bahama Bank.

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 3 leagues to the N.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., 3 miles.

From Memory Rock the edge of the bank trends to the N.N.W., and at 4 miles from the rock is the South end of a reef which is even with the water's edge. It is succeeded by others to the entire N.W. point of the bank, in lat. 27° 19′, long. 79° 05′. The Westernmost edge of the bank, and which is dangerous, is in lat. 27° 06′, long. 79° 12′, bearing N. 29° W., 10 miles distant from Memory Rock.

Inside the reefs the bank is clear to some extent, with from 3½ to 4 fathoms water.

When there is a sea from the N.E. on the N.W. point of this bank, 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. 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.

Matanilla Reef.

MATANILLA REEF.—This reef, which is a succession of shoal patches, was surveyed by Capt. E. Barnett, R.N., in 1846; his object being to find a suitable place for the location of a light-house. The reef appears to be a succession of very shoal spots with narrow channels between, of 5 and 6 fathoms water, commencing to the North and West of Walker's Key, running W., Northerly, from the latitude of 27° 19′, longitude 78° 40′, to longitude 79° 05′, latitude 27° 24′.

The extensive chain of keys which borders the North-eastern 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 2 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.

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 further 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 2 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 Wetherford'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 2 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 1½ mile of the watering-place with 3 fathoms, or come immediately abreast in 2 fathoms, within 300 yards of the shore. Wood may be had in abundance among the Keys, together with scale and shell 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 ironbound, 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.

PROVIDENCE CHANNEL, BAHAMA BANK, with its islands, Gulf Passage, and the FLORIDA COAST.—In preference to running down for Rocky Point, (which lies about 2m iles 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 that every man would do it.

Abaco light.

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.	20 do.
19	do.	40 do.
21	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 a half a mile from the shore. The time of high-water, at full and change, is at 8h., and the tide rises 3 feet.

High-water.

Hole-in-the wall.

HOLE-IN-THE-WALL.—The Hole-in-the-wall lies in latitude 25° 51′ North, longitude 77° 10′ West, and is the S.E. 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 lat. 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 inshore, 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 further 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 further 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.

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* 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.

Soundings taken on the Bank.

Soundings.

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.	do.
" 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 archway 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 part of the main-land is another corresponding projection, both which appear to have been caused by some convulsion of nature, of which the whole coast bears evident marks. It is covered with fragments of vessels, spars, &c., and the Western 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.

Tide.

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 2 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, 6 miles, when it will bear North, and then run W. ¼ N., 16 leagues, when the Stirrup Key will bear South, 6 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 W., 12 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° 49′ N., and longitude 77° 53′ W.

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 on 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 30 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 2 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 2 feet more when the sun is to the Northward of the equator than it does when to the

Tides.

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.

Extract from the Log-book of the surveying sloop Orbit.

"In approaching the Berry Islands the water is bold close in; 2½ miles from the shore, 11 fathoms; 2 miles, 9 fathoms; one mile, 8 fathoms; the Northernmost part of Stirrup Key bearing W. by N. 3½ miles, 7 fathoms; W.N.W., 2½ 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 round the Berry Islands till they bore N.N.E., 2 miles, and had 5, 4, 3, and 3½ fathoms; and far as 5 miles, 4, 3, 4, 4, 3½, 4, 3¾, and 3½ fathoms; N. by E., 6 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 6h., 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."

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. *Sheep Keys.*

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 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 2½ 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 with clear, hard white bottom.

Or you may follow the courses as given on the large chart of the Great Bahama Bank from the Admiralty Surveys, republished by E. & G. W. Blunt.

Centre of Great Stirrup Key bearing South, 3 miles distant, steer W.S.W., 28 miles, then S.W. by S., Southerly, 70 miles. Or S.W. ½ W., 26½ miles, then S.W. by S., 66 miles.

Either of the above courses will place you about 10½ miles from Orange Key, and in a proper place to run off the bank.

The straight course is S.W., 95 miles: this has the best water, but it is necessary to be very accurate in steering, to prevent running on the Sheep Key shoals.

All the courses are by compass.

Every attention should be paid to the steering and log, as it will be seen that the courses laid down border closely on the edge of the channel.

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 3 fathoms all the way, at high-water.

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.

Orange Keys.

ORANGE KEYS are a cluster of shoals and keys, lying near the West edge of the Great Bahama Bank, extending from lat. 24° 52′ to 24° 58′ N., and long. 79° 9′ 30″ 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 2 rocks, 6 feet out of water, about 15 feet in length; and one-half a mile S. by W. of these lie 2 smaller rocks. It is dangerous to pass between either of these rocks and the principal island, as reefs run out and connect them, 30 or 40 yards broad, and soon as over 4 fathoms. Three miles 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, in 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 eye announces. To the Northward it is not safe to approach within 3 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 attempted by any one, as you are obliged to pick your way through black patches, which are shoal. Variation, in 1820, 4° 26′ E.

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 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 lat. 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., 4 miles distant from Orange Keys, is the Galeon Shoal, having only 12 feet, and from thence to the Riding Rocks are a number of shoal patches, 1½ mile to the Eastward of the edge of the bank.

Riding Rocks.

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 3 small rocks, about 10 or 13 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 2 haycock rocks, just out of water, 6 or 8 yards from the land. There are also 2 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 2 rocks lie N. and S. There is a rock as big as a small boat about half a mile to the Northward of these 2 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 sizable isle, with various small keys in its vicinity, called Rock Key; there is good anchorage on its West part in 7 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 making a tack crossed over some shoals with only 1 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 2 miles, on and off the bank." *High-water.*

The edge of soundings, between the Riding Rocks and Orange Keys, is clean; you may enter on it without other care than that of the lead. From Orange Keys, which are 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 the bank between Orange Keys and Riding Rocks, means only the very 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 starlight 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.

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 different 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.

When you anchor on any part of the edge of the bank, in order to pass the night, or for a favorable tide, you ought to have everything 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 yon 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 seamanlike dexterity.

On leaving the bank you must be careful not to fall in with the Florida shore, or Double-headed Shot Keys, in the same time; but with day-light and a breeze, there is no danger in making either.

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 latitude 24° 10′ to latitude 24° 32′, 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 shoals lie 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 inshore 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 will 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 inshore, 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 Havana.

Providence N. W. Channel, and N.W. Edge of the Great 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. ¾ N., 95 miles, which will carry you to the West edge of the bank, and about 4 miles from the Little 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 to get far out from the edge of the 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 daylight.

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 port, in order to preserve the proper depth. In passing you will pass Little Isaac, Great Isaac, Bemini Isles, and Gun Key light.

Gingerbread Ground.

THE GINGERBREAD GROUND is a shoal of 10 miles in extent, in an E.S.E. and W.N.W. direction, and varying in width from 1 to 4 miles. It is full of rocky heads, with as little as 6 feet water. The S.E. point is in lat. 25° 50′, long. 78° 34′, and bears S. 86° W., 78 miles from the Hole-in-the-wall. The N.W. point is in lat. 25° 56′, long. 78° 44′, and bears S. 77° E., 7½ miles from the Eastern Little Isaac. Between it and the Little Isaac is broken ground; the shoal is about 1¼ mile within the edge of the bank.

Little Isaacs.

THE LITTLE ISAACS are 3 small rocky keys running in a W.N.W. direction; the Eastern one, which is 11 feet high, is in lat. 25° 58′ 30″, long. 78° 51′ 30′. The N.W. Key bears from the Eastern one N. 63° W., 3 miles distant. S. 83° E., 1½ mile from the Eastern Key, there is a rock a-wash at high-water. There is anchorage on the bank, to the Southward of the Isaacs, but which you must have daylight and the chart before you to run for.

The Brothers.

THE BROTHERS, which are two small rocky keys, bear N. 62° W., 7 miles, from the Little Isaacs. The bank is clear, and good navigation between them and the Isaacs.

The Great Isaac.

THE GREAT ISAAC, which is 40 feet high, is in lat. 26° 02′ N., long. 79° 6′ 30″. N.E. of it, 1½ mile, is a rock 12 feet high; and in a N.N.E. direction, one mile from the rock, there are 3 fathoms. To the South of the Great Isaac, for some distance, there is good anchorage, much better than to the Northward; as the only thing to be dreaded in anchoring is a sudden change of wind to the Northward; and in that case you have plenty of room to drift or get under way, which is not the case to the North of the Great Isaac.

Light-house.

The light-house building for the Great Isaac has just been completed in London. It is of iron, 120 feet high, and the light will be fixed, 161 feet above the sea. Lat. 26° 02′ N., long. 79° 06′ 30″ W.

Hen and Chickens.

THE HEN AND CHICKENS bear W. 53° S., 3¼ miles from the Great Isaac, and consist of 2 clusters of rocks, having 4 rocks in the Northern and 3 in the Southern cluster, on a bank of one mile in extent in that direction; from these to the Bemini Islands, the bank is clear, with the exception of the Moselle Shoal.

Moselle Shoal.

THE MOSELLE SHOAL, of 6 feet, bears from the North point of the North Bemini N. 24° W., distant 2½ miles. It is about one mile in length, in a N.N.E. direction. It bears S. 33° W., 13 miles distant, from the Hen and Chickens.

The flood here sets at the rate of about 1½, and the ebb 3 miles an hour.

The Beminis.

THE BEMINIS run S. 20° W., 6¼ miles. They are low sandy keys, two in number. On the Southern one there is a well. The South point of the South Bemini is in lat. 25° 44′ 30″, long. 79° 20′. The edge of the bank is very narrow here, not being over a mile from the keys.

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. 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.

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, extends 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.

From the South point of the South Bemini, the bank runs S. 4° E., some 6½ miles, which brings you nearly up with Gun Key light.

North of the Beminis are 2 rocks visible at the distance of 5 miles.

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 light-house has been erected, in 25° 34′ 36″ North latitude, and 79° 18′ 50″ West longitude. The light is 80 feet above the sea, revolves once in every minute, and may be seen in all directions, except between the bearings of S. by W. ¼ W. and S. ¾ E., where, at the distance of about 8 miles, it will be intercepted by the Bemini Islands. *Gun Key light-house.*

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 projects 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 3 feet. *High-water.*

The light being 80 feet above the level of the sea, it will be visible in clear weather at the distance of 12 miles, to an eye elevated 10 feet.

13	20 do.
15	40 do.
27	80 do.

From Gun Key light, the bank runs S. 27° E., 23 miles, which is up with the South Riding Rock. From here the edge of the bank runs again to S. 4° E., 19 miles, to Orange Keys.

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 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 the navigation by the Santaren Channel is 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 useful 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.

From the South, say 5 or 6 miles, of the Orange Keys, steer S.W. ½ W., 80 miles, which will bring you up with the light on the Double-headed Shot Keys, and from thence, if bound into the Gulf of Mexico, steer W. by S., which puts the current on your port bow, steering a little more South, if night, that you may make the FLORIDA REEF in the daylight. After making the reef you steer the following courses, as shown on the chart published by E. & G. W. Blunt, of the Florida Reef.

Carysfort light bearing W. ½ S., 4½ to 5 miles distant, steer S.W. by S., 19 miles, thence S.W. ½ W., 29½ miles, then W.S.W., 47½ miles, when the West Samboes Key will be North of you, 2½ miles distant; from thence W. ¾ S. will carry you up with the West end of the reef.

N. B.—The greatest attention must be paid to the steering and the log, in running these courses and distances.

West of the meridian of Key West there is often a Westerly current 12 miles in width South from the reef. *Southern Border of Great Bahama Bank.*

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., 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 2 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 3 leagues; and W. by S. from its middle, at the distance of 2 or 3 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 2 keys called Lobos, on which there is a beacon 20 feet high, and Guincho, or Wolf and Ginger Keys, both of which have foul ground about them, from N. 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 daylight. 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. 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 the 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 detached barren rocks, commonly known as the Double-headed Shot Keys, a light-house has been erected in 23° 56′ N. latitude, and 80° 28′ 30″ W. longitude.

Light-house.

The light is fixed, 96 feet above the sea, and may be seen in all directions, except on the bearing of S.W. ¼ W., 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., distant 3¼ miles.

The Dog Rocks are in 2 clusters, lying N. W. and S.E.—the South-east cluster having 3 islets and several detached rocks. There is a good channel 2 miles wide between the clusters.

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. It is high-water, at full and change, at 9 o'clock; the tide rises from 2 to 3 feet.

High-water.

The light being 100 feet above the level of the sea, it will be visible in clear weather at the distance 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 20¾ 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. 9 miles, in rather a circular direction, 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 little 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 S.E. extremity of the Anguila Islands is in latitude 23° 29′ 40″ N., and longitude 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° 46½′; 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 N.W. 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." *Tides.*

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. *Tortugas Islands.*

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 6 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, is in lat. 24° 36′. A reef of coral rocks run 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 S.W. 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 firewood, 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 a variety of sea-birds, turtle, and excellent fish.

Rebecca Shoal.

There is a channel 17 miles in width between the Eastern Key and the West end of the Florida Reef. Thirteen and a quarter miles from the Eastern Key, in an E. 6° S. direction, there is a shoal of 12 feet, about half of a mile in extent. Bush Key light bears West from the shoal, 174 miles distant. This is the only danger; with care, and seeing the light, it is preferable to going round the Tortugas; the beacon will make it perfectly safe.

Cayo Marquese is 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.

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 2 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.

Light-house.

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. 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 8 miles, as there is a shoal of 11 feet, of about 300 feet in length, in a N. by E. and S. by W. direction, bearing W. by S. ½ S., 7½ miles from the light.

In Garden Key Channel, the light-house bearing South, there is a shoal spot with 3 fathoms on it, while there are 6½ and 7 fathoms on each side of it.

Banks and Coast of Florida.

BANKS AND COAST OF FLORIDA.—Seventeen and a half miles to the Eastward of the Easternmost Tortugas, is the West edge of the bank called the Marquese Bank, and 15 miles further East, on this bank, is the key called Marquese Key, which is the Westernmost of a group, of which the Northernmost is Boca Grande Key; this key is the largest of the group, and is near 6 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 2 miles wide, with 10 or 12 feet water, sandy bottom. This channel is called Boca Grande, but no one who is not well acquainted should 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 are a number of islands, the three Southernmost having white sandy beaches. This second bank may be viewed as distinct from the third, although they are united on their Northern part by an isthmus of half a mile wide: otherwise they are separated by a channel of one mile in breadth, which has from 10 feet to 12 fathoms water, low-tide.

The third bank is that of Key West and the Pine Islands, the Western part is called by the former, and the Eastern by the latter name.

Light-house.

The light-house on Key West is a fixed light, 50 feet above the sea.

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, avoid the danger and delay of going round the Dry

Tortugas. 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 there are several ponds, which for 9 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, though small, is of tolerable height: it is 13 miles from Key West, is rough and covered with trees; and in whatever direction you see it, appears in the form of a saddle.

Off Bahia Honda a buoy is placed, in 27 feet water, bearing North, Looe Key beacon bearing W.S.W. ½ W.

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, as on its Western part, which is the Eastern part of the last bank of Key West and Pine Islands, there are 3 small islands, and on its Eastern part, upon the 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, which are the first you see coming from the Westward. Bahia Honda Bank has but few keys, and extends E., about 4 leagues.

The fifth bank is called Key Vacas, or Cow Keys, extending Eastward about 5 leagues; upon it a group called by the same name, 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 tolerably high hill covered with trees, which is on its Western part.

In the channel to the Westward of the Cow Keys you will have 2 fathoms water all the way within a mile of the keys, and will always find the deepest water nearest to the reef. The usual method of navigating between the reef and the keys, is, to proceed in the day-time, and lie at anchor in the night; and should you be obliged to anchor where there is any coral, it will be necessary to buoy up your cable to prevent it 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.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.

Indian Key.

INDIAN KEY.—Of all the Florida Keys, Indian Key may be the most readily distinguished: it is a wrecking station, and contains 5 or 6 houses, which give it the appearance of a settlement, but with the exception of a few tall cocoa-nut trees, the island is destitute of all vegetation.

With Indian Key bearing from N. to N.W. by N., vessels may run for it, crossing the reef in 4 fathoms, and gradually shoaling to 3 fathoms when within a mile and a half of the key, where they may anchor safely.

Two miles N.E. of Old Matecumbe you will find Little Matecumbe, which in this same direction is 4 miles in length; it is covered with high trees. Off its N.E. part there is a small mangrove island, separated by a channel 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 a channel, like the others, from Long Island.

N.E. from Long Island lies Key Largo, separated 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 it is one of the anchorages 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 N.N.E., N. by E., and N., on which last course there are various keys for some distance. The last is called Key Biscayno, the Eastern point of which is called Cape Florida.

Fixed light

Key Biscayno lies a little to the Southward of Cape Florida. On it is a fixed light, 75 feet above the sea.

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 Saunders' Hat bears S.S.W.

From Key Biscayno to Hillsborough Inlet there is a narrow reef, running parallel to the shore, about 5 miles distant, having on it, off New River, 12 feet.

Jupiter Inlet. JUPITER INLET.—A light-house is being erected at this inlet, in about lat. 27° N., long. 80° 08′ W.

In lat. 27° 17′, 2 miles from the land, there is a shoal of 2½ fathoms, and in lat. 28° 03′ a shoal nearly dry, 5 miles from the land.

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. The soundings off Cape Canaveral, that cape bearing W. by S., are 55, 75, and 90 fathoms, at 32, 36, and 39 miles distance.

Cape Canaveral light-house. CAPE CANAVERAL LIGHT is a revolving light, 65 feet above the sea.

Bearing from the light-house N.E. by N., and distant from it 11¾ nautical miles, there is a shoal with 15 feet water on it at low-tide; and there is one with 8 feet water on it at low-tide, 11¼ miles from the light-house, bearing from it N.N.E. ¼ E.

These shoals, distant from one another 1½ mile, and bearing from each other E. by S. and N. by W., are the extremities of a bank with 3, 4, and 5 fathoms water on it.

With the eye elevated 26 feet above the sea, the land cannot be seen from them in a clear day; and the light-house is only faintly visible.

Shoals. These shoals are the more dangerous, because deep water surrounds the bank on which they lie.

In bad weather, breakers point out their place, but with a smooth sea no indication of their existence is given.

A shoal runs out from the light-house very nearly 5 miles in a S.E. ½ E. direction. Separated from this by a channel one mile wide and 4 fathoms deep, is a small shoal with 11 feet water on it at low-tide; it bears S.E. by E. ½ E. from the light-house, and is 6¼ miles distant from it.

Between the light-house and South-east shoal is a beach channel, with 6 feet water in it at low-tide.

Though there are deep channels between the outer shoals and the light-house, there are numerous shoal spots which render the navigation through them dangerous to large vessels.

Vessels wishing to lie under the Cape in Northerly or Westerly winds, should bring the light-house to bear N.E., and anchor in 15 or 17 feet water, about one-third of a mile from the beach.

Directions for the Beach Channel.—Bring the light-house to bear W.S.W., and run for it—keep the South end of the stable roof in a range with the middle of the light-house, until within 150 yards of the beach. Then steer South and pass the Cape.

At low-tide, the depth of water in this channel is 6 feet. Especial care must be taken to guard against the current, which was found to set strongly to the Northward. The light-house and stable are so close together that the range must be closely watched.

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 2 miles of it.

Seven leagues N. 25° W. from New Smyrna, is the entrance to Matanzas, but only vessels of very light draught can enter it: this bar has 8 feet, at high water. From this entrance there is an inland 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 7h. 15m. The whole of this piece of coast is equally clean with the anterior. You have 8 fathoms one league from the land.

High-water.

From Matanzas to St. Augustine is 12 miles, and the island of St. Anastasia extends the whole length; you may keep along it at 2 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.

SOUNDINGS OFF FLORIDA.

Off the whole of the coast from Cape St. Blas, as after mentioned, extend banks of soundings which stretch a long distance from the land, which are generally known the name of Tortugas soundings. There is no danger in the whole of it, but a spot of sand in latitude 28° 35′, about 12 miles East of the meridian of St. Blas.* This knoll has but 3 feet on it, and is so steep that from 100 fathoms you will

* It is extremely doubtful whether this knoll exists.

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, or when navigating to the Southward, that you may leave soundings with safety off its Southern edge.

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 from E.N.E. or E.; but when for 2 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 16 feet draft; but over White Shoals you will endanger the ship if she is large, especially if the weather is thick, when the bottom does not show itself clearly. *Florida Reef.*

From the Eastern meridian of Boca Grande the navigation is safe, until within 4½ miles of Sand Key, on which is a light-house, bearing S.S.W. from Key West light, distant 7¼ 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 2 or 3 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. 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 East of this key is very dangerous, being cut up by coral rocks, with channels which should only be attempted through necessity, and in daylight, as nothing is so useful in the navigation of this reef as a good look-out. 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. North of Key Tavernier, which is in lat. 24° 59′, 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. *Light-house.*

TURTLE HARBOR.—This harbor is 4½ miles to the Northward and Westward of Carysfort light, easy of access, and may become an important harbor of refuge if properly marked by a beacon and buoys. The depth of water at the entrance to the channel is 26 feet, and the light-house, from its proximity, assists in guiding to the anchorage, which is soft clay. *Turtle Harbor.*

CARYSFORT REEF, on which there is a light-house, is the most dangerous reef on the whole coast, the South extremity of which is in latitude 24° 59′ N., and lies immediately off Sound Point. *Carysfort Reef light-house.*

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 5 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 has also a bank lying off its East side. *The Fowey Rocks.*

There are several openings, or inlets 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 25° 04′ 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, Tavernier and Rodrigues, show themselves plainly enough in the West.

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 the 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.

Day-marks. The following day-marks along the Florida reefs, from Cape Florida to Sand Key light-houses, occupy the positions of the Coast Survey signals used in making surveys on that coast. They are each composed of an iron shaft 36 feet high, erected upon iron screw foundations, distinguished by a vane, upon which one of the letters of the alphabet is painted, and above it a lattice-work hoop iron cylinder or barrel.

Three colors (white, black, and red) are used in painting each signal to render them as striking to the eye of the mariner as possible, and are so combined that no 2 adjacent day-marks have the same colors upon like parts.

Masters of vessels may ascertain their latitude or longitude with tolerable certainty by examining closely the colors of the beacons as they are approached, and if the letter painted on the vane is distinguished, there can be no mistake in determining their position.

These day-marks are placed on the most projecting and dangerous points of the Florida Reef, and are in general from 4 to 6 miles from the outside (seaward) shores of the Florida Keys, and within half a mile, in every case, of the edge of the gulf stream.

The depth of water where these signals stand does not exceed 4 feet at low-tide, in any case, and just outside of them to the Eastward, in the gulf stream, it is of unknown depths.

These day-marks may be approached from seaward within a few hundred yards, but it would always be prudent, and particularly with very light winds, or in bad weather, to give them a good berth.

In moderate weather it often happens, especially after Easterly gales, that the force and direction of the gulf stream sets across the reefs, and then vessels are imperceptibly carried amid its dangers, although the course steered should, if made good, carry them outside of all danger.

When the master of a vessel finds one of these beacons to the Eastward of him, he may be sure that he is between the reefs and the keys, and consequently surrounded by shoals and dangerous rocks.

New Signals. *Cape Florida light-house—tower white.*—On South point of Key Biscayno, off the South-east point of Florida.

Latitude 25° 39′ 56″ N., longitude 80° 09′ 29″ W.

Fowey Rocks beacon.—Letter P, painted *red*, on the vane; hoop iron lattice-work cylinder, *white*; shaft and vane *black*. Bears from Cape Florida light-house, S. 35° 41′ 55″ East, (true,) distant 5½ nautical miles. Bears from Soldier Key, S. 89° 58′ 16″ East, (true,) distant 3½ nautical miles.

Latitude 25° 35′ 23″ N., longitude 80° 05′ 51″ W.

Triumph Reef beacon.—Letter O, painted *black*, on the vane; hoop iron lattice-work cylinder, *red*; shaft and vane, *white*. Bears from Elliott's Key, No. 1, S. 82° 30′ 26″ East, (true,) distant 3½ nautical miles. Bears from Soldier Key, S. 21° 04′ 14″ East, (true,) distant 7¼ nautical miles.

Latitude 25° 28′ 37″ N., longitude 80° 06′ 50″ W.

Long Reef beacon.—Letter N, painted *white*, on the vane; hoop iron lattice-work cylinder, *black*; shaft and vane, *red*. Bears from Elliott's Key, No. 1, S. 52° 15′ 21″ East, (true,) distant 3¾ nautical miles. Bears from Soldier Key, S. 13° 53′ 51″ East, (true,) distant 8 3/10 nautical miles.

Latitude 25° 26′ 45″ N., longitude 80° 07′ 21″ W.

Ajax Reef beacon.—Letter M, painted *red*, on the vane; hoop iron lattice-work cylinder, *white*; shaft and vane, *black*. Bears from Elliott's Key, No. 2, S. 79° 35′ 43″ East, (true,) distant 3 9/10 nautical miles. Bears from Elliott's Key, No. 1, S. 26° 06′ 05″ East, (true,) distant 5 4/10 nautical miles.

Latitude 25° 24′ 09″ N., longitude 80° 07′ 59″ W.

Pacific Reef beacon.—Letter L, painted *black*, on the vane; hoop iron lattice-work cylinder, *red;* shaft and vane, *white*. Bears from Old Rhodes Key, N. 76° 29′ 51″ East, (true,) distant 5½ nautical miles. Bears from Elliott's Key, No. 1, S. 15° 48′ 15″ East, (true,) distant 7 1/10 nautical miles.

Latitude 25° 22′ 13″ N., longitude 80° 08′ 30″ W.

Turtle Reef beacon.—Letter K, painted *white*, on the vane; hoop iron lattice-work cylinder, *black;* shaft and vane, *red*. Bears from Old Rhodes Key, S. 22° 20′ 47″ East, (true,) distant 4 1/10 nautical miles. Bears from Cæsar's Creek bank, S. 6° 28′ 07″ West, (true,) distant 6 1/10 nautical miles.

Latitude 25° 16′ 52″ N., longitude 80° 12′ 34″ W.

Carysfort Reef light-house.—An iron pile light-house tower and keeper's quarters, *dark color*. On Carysfort reef, near the edge of the gulf stream, and to the Eastward of Key Largo.

Latitude 25° 13′ 15″ N., longitude 80° 12′ 44″ W.

The Elbow beacon. (Building.)—Letter I, painted *red*, on the vane; hoop iron lattice-work cylinder, *white;* shaft and vane, *black*. Bears from Grecian Shoals beacon, N. 60° 45′ 40″ East, (true,) distant 2 1/10 nautical miles. Bears from Carysfort Reef light-house, S. 29° 29′ 35″ West, (true,) distant 5 3/10 nautical miles.

Latitude 25° 08′ 32″ N., longitude 80° 15′ 40″ W.

Grecian Shoals beacon.—Letter H on vane, painted *black;* hoop iron lattice-work cylinder, *red;* shaft and vane, *white*. Bears from Sound Point, S. 45° 58′ 23″ East, (true,) distant 3 9/10 nautical miles. Bears from Basin Bank, S. 21° 24′ 32″ West, (true,) distant 5 3/10 nautical miles.

Latitude 25° 07′ 22″ N., longitude 80° 17′ 57″ W.

French Reef beacon.—Letter G on vane, painted *white;* hoop iron lattice-work cylinder, *black;* shaft and vane, *red*. Bears from Lower Sound Point, S. 32° 33′ 53″ East, (true,) distant 5 nautical miles. Bears from Point Willie, S. 10° 30′ 07″ East, (true,) distant 6 3/10 nautical miles.

Latitude 25° 02′ 06″ N., longitude 80° 21′ 05″ W.

Pickles Reef beacon.—Letter F painted on vane, *red;* hoop iron lattice-work cylinder, *white;* shaft and vane, *black*. Bears from Point Charles, S. 16° 57′ 43″ East, (true,) distant 5 1/10 nautical miles. Bears from Lower Sound Point, S. 6° 34′ 30″ West, (true,) distant about 7 nautical miles.

Latitude 24° 59′ 22″ N., longitude 80° 24′ 55″ W.

Conch Reef beacon.—Letter E painted on vane, *black;* hoop iron lattice-work cylinder, *red;* shaft and vane, *white*. Bears from Rodrigues Bank, S. 4° 30 West, (by compass.) Bears from Key Tavernier, S. 43° 30′ East, (by compass.)

Latitude 24° 56′ 36″ N., longitude 80° 27′ 50″ W.

Crocker's Reef beacon.—Letter D painted on vane, *white;* hoop iron lattice-work cylinder, *black;* shaft and vane, *red*. Bears from Snake Creek Point, S. 39° 15′ East, (by compass,) distant between 4 and 5 miles.

Latitude 24° 54′ 21″ N., longitude 80° 31′ 26″ W.

Alligator Reef beacon.—Letter C painted on vane, *red;* hoop iron lattice-work cylinder, *white;* shaft and vane, *black*. Bears from Indian Key, S. 66° 30′ East, (by compass,) distant about 5 miles.

Latitude 24° 49′ 08″ N., longitude 80° 38′ 08″ W.

Coffin's Patches.—The light-house building on Coffin's Patches has been abandoned, and one is now being built near Sombrero Key, in stead.

American Shoals beacon.—Letter B painted on vane, *black;* hoop iron lattice-work cylinder, *red;* shaft and vane, *white*. Bears from Loggerhead Key, S. 22° 16′ 35″ West, (true,) distant 5 9/10 nautical miles. Bears from Eastern Sambo beacon, N. 76° 38′ 59″ East, (true,) distant 8 1/10 nautical miles.

Latitude 24° 31′ 24″ N., longitude 81° 31′ 16″ W.

Eastern Sambo beacon.—Letter A painted on vane, *white;* hoop iron lattice-work cylinder, *black;* shaft and vane, *red*. Bears from Geiger's houses, S. 3° 29′ 24″ East, (true,) distant about 4½ nautical miles. Bears from South Saddle Hills, S. 13° 13′ 01″ West, (true,) distant 5 nautical miles.

Latitude 24° 29′ 32″ N., longitude 81° 39′ 55″ W.

Sand Key light-house.—An iron pile structure, 121 feet high, painted a *dark color*, surmounted by a lantern painted *white*.

This light house is 7¼ nautical miles, in a South-westerly direction, from the Key West light-house.

Latitude 24° 27′ 09″.5 N., longitude 81° 52′ 43″.5 W.

Directions for sailing from the Eastward through the Hawks Channel.

Key Biscayno, on which there is a light-house containing a fixed light, 75 feet above the sea, lies within, and forms the West side of the Northern entrance of the channel *Light-house.*

or passage between the Florida Keys, or Martyrs, on the West and North sides, and the Florida Reefs on the East and South sides, called Hawke Channel. The coast, for 4 or 5 leagues to the Northward of the key, has foul ground, and the sea breaking upon it has a frightful appearance, but there is nowhere 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 anywhere within, till you come abreast of the South end of the key, where there is a small bank of 11 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. In sailing through the channel, from the Soldier's Keys to the Southward, you should 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. Go no nearer to the Soldier's Key than 12 feet water, and no further off to the Eastward of them than 18 feet water.

About a mile E.S.E. from Saunders' 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 Saunders' Cut to Saunders' 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 further towards the reef; but very great care must be taken in order to avoid the heads.

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. 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 the 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, and the same rule for keeping without 12 and within 18 feet, still holds good; but 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.

Indian Key. INDIAN KEY.—Of all the Florida Keys, Indian Key may be the most readily distinguished: it is a wrecking station, and contains 5 or 6 houses, which give it the appearance of a settlement, but with the exception of a few tall cocoa-nut trees, the island is destitute of all vegetation.

With Indian Key bearing from N. to N.W. by N., vessels may run for it, crossing the reef in 4 fathoms, and gradually shoaling to 3 fathoms when within a mile and a half of the key, where they may anchor safely.

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 5 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. About a mile from its N.E. end, on

the extremity of a reef, lies the small 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. 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, a S.W. by W. ½ W. course, 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 to W.S.W. ¼ W., with the same 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. To the West end of 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 stated, 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 Marquese. This bank of quicksand may be always seen in the day-time, it being very white, and therefore may be easily avoided.

Directions for Key Biscayno.—Bound into Key Biscayno from the North, you can run close in with the beach until within one or half a mile of *Bare Cut** ; you must then give the shore a berth of not less than one mile, (be careful not to get into less than 3 fathoms water ;) your course will be S. by E., made good.

When *Soldier Key* † bears W. by N., steer for it until the light-house on Key Biscayno bears N. by W.; then steer for the light-house until *Little Soldier Key* ‡ is on with Soldier Key; your course will be thence from N. by W. to N. by E., according to the tide, ebb or flood; but the points of the 2 Soldier Keys must be kept just on, or very nearly so, (the little one to the East of the large one) until the sand point of the beach (South end of Key Biscayno) is opened out to *the Westward*, pass the high point of mangroves, (N.W. and the inner point of the same) from 30 to 50 yards; this will bring you close to the Northern sand-bar, thence off for the light-house, about N.W., keeping the sand-bars (on your starboard hand) close aboard, which at all times show very plainly. As you draw up with the point of the island, keep a little further off the sand-bars, pass the point from 100 to 200 yards distant, and when the light-house bears N. 30° E., anchor. Here the channel is bold up to the beach, and over to the South bank, which forms the harbor, and in which you will have from 2½ to 3 fathoms water.

Directions for crossing the Reef at Cape Florida.—Get the light-house to bear W. N.W., and steer for it until you get into three fathoms water, and then keep S.W. by S. When Soldier Key bears W. by N., distant 1 or 2 miles, then you will have good anchorage under Fowey's Rocks. The reef will then bear E. by N. ½ N. Depth of water 3 fathoms.

Directions for running down inside of the reef from Cape Florida to Key West.—The course from Cape Florida to Soldier Key is S. by W.

From Soldier Key to Bolles' Bank, S. ½ E, depth of water 2 fathoms.

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* Bare Cut is the first opening North of Key Biscayno light, and is distant from same about 7 miles.

Narrow Cut is North of Bare Cut about 3 miles, and is immediately abreast of Miama River, at the entrance of which there are settlers, whose houses show very plain while passing.

† Soldier Key is a small key with high growth, bearing from Key Biscayno light-house S. 40 30′ W., distant about 6 miles, and is from 5 to 700 yards in circumference.

‡ Little Soldier Key bears about S. from Soldier Key, and is very small, with a lower growth than the large one; it is about 600 yards distant from the other.

The tide here sets about E.S.E ebb, and W.N.W. flood, and runs very swift on the full and change of the moon.

From Bolles' Bank to Cæsar's Creek, S. by W., distant 25 miles.

From Cæsar's Creek to Old Roads, S. by W.

From Old Roads to Basin Hill is S.W. by S. ½ S., depth of water 2½ fathoms.

From Basin Hill to Upper Sound Point, is S.S.W., depth of water from 10 to 12 feet.

From Upper Sound Point to Lower Sound Point there are 15 feet water, soft bottom.

From half-way between these 2 points to Tavernier, the course is S.W. by S. with from 10 to 12 feet water.

From Tavernier to Snake Creek, S.W. by S., with 3 fathoms water.

From Snake Creek to Indian Key, S.W., with 14 feet water.

Get Matecumbe Cut just open, and then steer S.W., with from 12 to 14 feet water, hard bottom.

Get Indian Key to bear N.N.W., and steer for it until within a quarter of a mile, then the anchorage is good. Water from 10 to 12 feet.

From Indian Key to the East point of Viper Key the course is S.W. ½ W., depth of water from 15 to 18 feet.

From the East point of Viper Key to the East point of Duck Key, the course is S. W. by W. ½ W., and then W.S.W. to Crane Cut, and then S.W. to Jacob's Harbor, and W. by S. to Sister Keys, with from 18 to 24 feet water.

From Sister Keys to Loggerhead Key is W. by S. ½ S.

From Loggerhead to Saddle Hills is W. by S.

From Saddle Hills to Boca Chica, W.S.W., with from 4 to 5 fathoms water.

From Boca Chica to Key West, the course is W. by S. ½ S.

Tides. 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 everywhere, 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 5 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 boat, 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, 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 Samboe's 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.

There is a beacon on Looe Key 30 feet high, on which is a large ball, painted red.

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 goes on diminishing, and when abreast of Old Matecumbe you have but 3 fathoms, and abreast of Key Tabano 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 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 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 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, especially after rains.

Sand Key Light.

SAND KEY LIGHT is a Fresnel first order fixed light, varied by flashes, 110 feet above the sea. From an elevation of 15 feet above the level of the sea, it should be seen at the distance of nearly 17 nautical miles. It is in lat. 24° 27′ 09″ 5 N., long. 81° 52′ 43″ 5 W.

Key West light.

KEY WEST LIGHT is on Whitehead's Point, S.W. point of the island. It is a fixed light, 50 feet above the level of the sea.

A beacon has been placed on the Middle Ground, Sand Key channel, harbor of Key West.

This beacon, on a single shaft, is octagonal in shape, and surmounted by an octagonal box. The shaft, top of cage, and the box, are painted black. The sides of the cage are painted white.

The following are the bearings from this beacon:

Key West lights, N.E. ¾ E.; Sand Key lights, S. ¼ E.; N.W. Channel light, N. 2° W.

Key West.

KEY WEST.—*East Channel.*—Bring the East side of the Key West light-house to range with Filor's observatory, and steer for it N.W. by N. When West Sambro bears E. ½ S., steer W. ½ N., until the light-house bears N.N.W. ½ W., or in range with O'Hara's observatory. Continue on this range until Sand Key bears S.W. ¼ W., and the Eastern edge of Key A or Snipe Key is on with the West edge of Mullet Key. Keep this range, steering W. by N. ¾ N., until Tift's and Filor's observatories are in range, (Key West light-house bearing N.E.,) then steer on this range N. N.E. nearly till opposite the Fort, then N. ½ W. until off the Lazaretto, when anchor in 4¾ fathoms water, or when opposite the Fort, steer for the West edge of Fleming's Key, and giving the wharves a small berth, anchor off the town.

Main Ship-channel.—Bring Key West light-house to bear N. ½ W., and steer for it, crossing the reef in not less than 5 fathoms. When Sand Key light bears S.W. by W., anchor and wait for a pilot, if the vessel draw over 16 feet water. Drawing less than 16 feet, continue on until Sand Key bears S.W. ½ S., and the Western edge of East Crawfish Key is in range with the West edge of Cotteral's Key. Keep this range, steering N.W. by W. ¼ W. nearly, until Tift's and Filor's observatories are in range, and Key West light-house bears N.E., when proceed as above directed under head of East Channel.

At Night.—Bring the North Star to range over Key West light-house, and stand for it; when Sand Key light bears S.W. by W., a vessel drawing over 16 feet water had better anchor and hail for a pilot.

Rock Key Channel.—Bring the West edge of West Crawfish Key in range with the middle of Snipe Key, and steer on that range until N. by W. ½ W.; when the East edge of Man Key ranges with the centre of Middle Ground, steer for Tift's observatory, N.N.E. ¾ E.; when the light-house bears N.E., bring Tift's and Filor's observatories in range, and proceed as before directed.

Sand Key Channel.—Bring the Western edge of Snipe Key in range with the N. W. light-ship, and run for it N. ¼ E., or bring East Crawfish Key to bear N. by E. ¾ E. nearly, and steer on this course. When Key West light-house bears N.E. ½ E., steer for it. When Tift's and Filor's Observatories are in range, proceed as before directed.

West Channel.—A course for Key West light-house N.E. ½ E. carries a vessel in clear, until Tift's and Filor's observatories are in range, when proceed as before directed.

North-west Channel.—To pass through this channel to the Gulf of Mexico without stopping at Key West. When Key West light-house is in range with the South end of the Fort, and the inner buoy off Whitehead's Point bears S.E. ¾ S., steer N.W. ¾ N. until Filor's observatory ranges between Northern and middle churches of Key West, bearing S.E. ¾ E. Then steer (keeping this range N.W. ¾ W.) until the South edge of Boca Grande Key is shut in behind Cotteral's Key and the N.W. buoy is in range with Tripod beacon, bearing N. ¼ E., when steer for the buoy, passing close to it on either side. This course carries 12 feet at low-water. The banks on each side of the N.W. channel are plainly visible, and will serve as a guide. At night, without a pilot, vessels run great risk of getting on shore, and even with one it is not easy to go clear.

Light-house. A light-house has been erected in 6 feet water in the N. W. Passage. It is a fixed light, 40 feet above the level of the sea.

To enter the channel by day, bring the light-house to bear S. by W. ¾ W., or in a range with the buoy on the bar, and the Western end of Mullet Key; then run till the bar is crossed and buoy No. 2 is made, when haul up S.E. ¾ E., for buoy No. 1.

To enter at night, bring the light to bear S. by W. ¾ W., and run on that course till Key West light bears S.E. ¼ S., when haul up for it, and when in 3 fathoms anchor for the night.

Beacons and buoys as they are passed on entering the channels to Key West harbor.

Point of Reef buoy is a red can, No. 2, with staff, in 18 feet water, Key West light bearing N.N.W.; Middle buoy, N.W. ½ N.

Middle buoy is a red and black striped nun, in 16 feet water on Triangle Shoal, and may be passed on either hand. Key West light bears N. ½ W.; Whitehead spit buoy N.N.W. ½ W.

Whitehead spit buoy is a red nun, No. 4, in 18 feet water, Key West light bearing N.E. by N.; Fort Taylor. N. by E. ¾ E.

Old Main Ship-channel.

Entrance buoy is a white and black striped can, with a staff, in mid-channel, in 48 feet water, and may be passed on either hand close to. Key West light bears N. ½ W., middle buoy on Triangle Shoal, N. ½ W., for which steer after passing this buoy.

Entering by North-west channel from the Gulf of Mexico.—Bar buoy is a black and white striped nun, in 11 feet water, Key West light bearing S. by W. ¾ W.; Cotteral's Key, S.W. by S.

Rocky Point buoy is a red nun, No. 2, in 17 feet water, Cotteral's Key bearing S.W. ¼ S.; town of Key West, S.E. by E.

Buoy No. 1 is a black nun, on the N.W. tail of the Middle Ground, in 24 feet water, E. end of Crawfish Key bearing S. ¾ W.; centre of town, S.E. ¾ E.

Channel buoy is a white and black striped nun, in 27 feet water, mid-channel, Sand Key light bearing S. by W. ¼ W.; Key West light, S.E. by E. ½ E.

To cross the bar bring the bar buoy in range with the light-house, and steer for it, passing it on either hand; then steer for Rocky Point buoy, No. 2, which leave on the starboard hand, and steer S.E. ¾ E. for Middle Ground buoy, No. 1, which leave on the port hand. Then steer S.E. ¾ S. for channel buoy, when, if bound through, steer S.E. ¾ S. to Whitehead Spit buoy No. 4, which leave on the port hand, and steer S. E. by S. to the reef buoy, No. 2, which leave on the port hand, and you are all clear. If bound to Key West, when up with channel buoy, haul up for Key West light, and run in.

	Sand Key.	*North-west channel.*
High-water, full and change	8h. 11m	11h. 10m.
Spring tides rise	2 0 feet	3 5 feet.
Neap " "	0 6 "	1 9 "

Directions for crossing the reef at Loggerhead Key.—Get this key to bear N.N.W. and steer for it. You will cross the reef in 3½ or 4 fathoms water.

Directions for crossing the reef at Bahia Honda.—Get Bahia Honda to bear from W. to N.W., and you will have from 2½ to 3 and 4 fathoms.

Directions for crossing the reef at Knight's Key.—Get Knight's Key to bear N.N. E., and steer for it, and you will cross the reef in 3½ or 4 fathoms water.

Directions for crossing the reef at Duck Key.—Get Duck Key to bear W. by S., and steer for the East point, having from 3 to 4 fathoms.

Directions for crossing the reef at Indian Key.—Get Indian Key to bear N. by E. and steer for it, and cross the reef in 3 and 3½ fathoms.

Directions for crossing the reef at Tavernier.—Get Tavernier to bear W. by N. N., and steer for it. You will cross the reef in 9 and 10 feet water.

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 Sanibel. 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, 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. *Cape Romano.*

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 Tancha.

CAPE ST. BLAS.—Cape St. Blas is a low point, which runs to the Southward 2 miles. From the 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. *Cape St. Blas.*

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. *Tide.*

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. *Tide.*

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 end 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.

Cedar Keys. CEDAR KEYS.—South, a little East, 10 miles from the mouth of the Suwannee, are Cedar Keys. The Sea-horse shoal runs off from that key 10 miles S.W., and thence 5 miles S.S.W., with shallow spots of a few feet water. The channel is buoyed off, and pilots can be obtained. The latitude of Sea-horse Key is 29° 4′ N., long. 83° 02′ 45″ W. Cedar Keys light is on the East end of the mound on Sea-horse Key. It is a fixed light, with flashes every minute, 75 feet above the sea, and can be seen 14½ miles.

Light.

The key cannot be seen from the Southern point of the shoal.

Fifty-five miles South of Cedar Keys 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 10 leagues from the land you have but 5 and 6 fathoms, and 2 leagues you will have from 6 or 7 feet. Key Anclote is distant across from the main-land 4 miles, and in length about 8 miles North and South: it is divided into three parts, and its South part has good anchorage in 3 fathoms of water.

From Key Anclote the coast runs S.E. by E. 30 miles to the entrance to 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 4 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 4 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 prevailing wind. The tide rises 2 feet, and when the wind is off shore, it runs with great velocity.

Tide.

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 Sanibel to the Southward. This opening extends to Shoal Lagoon, which communicates by various shoal channels with Bay St. Carlos.

Key Sanibel has good anchorage on its South part in 2 fathoms, sheltered from all winds. This anchorage of Sanibel is known by a palm-tree, 2 leagues to the Southward of it, and is the only one you see on the whole coast. To anchor in Sanibel, it is necessary to run with care, and the lead in hand, that you may avoid the shoal bottoms which run off 4 miles from Sanibel, and the keys S.E. of it.

From Sanibel the coast runs S.E. by E. 11 leagues to Point Largo, or Key Roman. This piece of coast is clean, having 3 fathoms at 2 miles from the land. Point Largo sends out S. and W. of it a shoal, which runs from it 7 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. 25 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, or Charlotte Harbor. BOCA GRANDE, or CHARLOTTE HARBOR.—The course into Charlotte Harbor is E.N.E. Charlotte Harbor forms a large bay of 8 or 10 miles in width, but very shoal, having only from 10 to 12 feet water.

In entering this harbor you pass between Boca Grande Key and Casperillo Key, bearing N.N.E. and S.S.W. from each other, distant three-quarters of a mile, having 6 fathoms water between them. When Casperillo Point bears N.E. by E., distant 4 miles, you are then up with the outer bar, which is three quarters of a mile in width, having 3 fathoms water at low-tide. The current sets in and out of the harbor at the rate of 2½ knots, running in 7 and out 5 hours. The entrance of the harbor may be known by a bunch of trees at the Northward and Westward of the entrance.

N. B. This harbor produces the finest oysters, and the greatest variety of fish, wild fowl and deer, of any other upon the whole coast.

TAMPA BAY.—The next harbor to the N.W. is Tampa Bay, or Espiritu Santo. *Tampa Bay.* In entering the ship-channel, bring Mullet Key to bear E. by N. and Egmont Key E. by S.: the N.E. point of Egmont Key is bold. Keep midway between the two keys, leaving Egmont Key on the starboard, and Mullet Key on the port hand, having from 3 to 5 fathoms water. The bar extends off from Egmont 2 miles. At high-water on *High-water.* the bar 2½ fathoms.

On Egmont Key there is a fixed light, 45 feet above the sea. *Light.*

Buoys as they are passed in entering Tampa Bay by the West Channel.

Mullet Key shoal buoy is conical, painted black, No. 1, in 16 feet water, Egmont *Buoys.* light-house bearing E. by S. ½ S.; buoy No. 2, S.S.W.

Egmont Key shoal buoy is conical, painted red, No. 2, in 16 feet water, light-house bearing E. by N.; S. end of Egmont, E. ½ S.

Mullet Key buoy (in the bay) is conical, painted black, No. 3, in 16 feet water, on the South-east edge of Mullet Key flats. Centre of Josephine's Island bears N.N.W. ½ W.; Egmont light-house, S.W. by W. ½ W.

Stanard's Point buoy is conical, painted red, No. 4, in 15 feet water, Egmont light-house bearing W. ½ N.; Piney Point, N. by E. After passing this buoy the course up the bay is N.E.

Middle Ground buoy is conical, painted black, No. 5, in 16 feet water, Mangrove Point bearing N.E. by N.; Gadsden's Point, N.N.E. ¼ E.

Mangrove Point buoy is conical, painted red, No. 6, in 16 feet water, Mangrove Point bearing S.S.E. ½ E.; Piney Point, S.W. by W.

Gadsden's Point buoy is conical, painted black, No. 7, in 16 feet water, Old Tampa Bay Point bearing W. by N.; Gadsden's Point, N. by W.

Vessels drawing over 12 feet can only go a short distance above this buoy. The best holding-ground is here.

South-west Channel.

Bay buoy is conical, painted black and white stripes, in 16 feet water, Egmont *Buoys.* light-house bearing N.N.E. ½ E.; South point of Egmont, N.E.

Sambo buoy is conical, painted red, No. 2, in 13 feet water, on a sand bar, on South side of the channel. The sea breaks on this sand-bar, in moderate winds from the South-west.

There is a white and black striped conical buoy, in 9 feet water, on the bar of Manitee River, in the best water.

Red buoys to be left on the starboard, and black on the port hand, entering; striped buoys on either hand.

Directions for the S.W. Passage to Tampa Bay.—Bring the S.W. end of Egmont to bear N.E. by N., and run for it, in 2½ and 3 fathoms water, at low-tide.

One high-tide in 12 hours; runs in 6 and out 6 hours.

The 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 3¼ fathoms.

The entrance is obstructed by several sand-banks, upon which rise some inlets; between these banks there are 3 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 3¼ fathoms, and the second has 2¾ 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 are 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 3 fathoms along the edge of it.

A fixed light, 73 feet above the sea, is on the Eastern side of the entrance to St. *Light-house.* Mark's.

ST. MARK'S.—If you are bound to St. Mark's and fall into the S.E. of it, work *St. Mark's.* 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 3 stakes on it. You will see a small house, on an island 4 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 2 miles.

Buoy. There is a red can buoy, No. 2, on the East bank of the bar of St. Mark's, in 8 feet water, and a black can buoy, No. 1, on West Bank, in 7½ feet water.

On the Middle Ground is a can buoy, red, No. 4, in 8 feet water, and on Long Bar, a red nun buoy with a mast, No. 6, in 2 feet water; other obstructions and dangers are marked by stakes.

A shoal, having 3 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. ½ W., 37 miles, to Cape St. George, which is the Southernmost point of St. George's Island; this island is 24 miles long, and forms, with Dog Island, the South side of St. George's Sound. The East end of Dog Island is S.W. ½ 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. DOG ISLAND LIGHT is a revolving light on the West end of Dog Island, and is 48 feet above the sea. It revolves in 3 minutes, and bears from the bar N. ½ E., distant 2½ miles. To distinguish it in the day-time from the light-houses of St. Mark's and St. George's, it has a black horizontal strip near the top.

Middle Entrance into St. George's Sound. 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 bar; 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 St. 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.

Buoys. 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.

Light On the South point of St. George's Island there is a fixed light, 77 feet above the sea.

Apalachicola Bay. APALACHICOLA BAY.—When the South point of St. George's Island, (which lies to the Southward of Apalachicola Bay,) bears North, 2 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 3 fathoms when over the bar, deepening gradually; and between the islands of St. George's and St. Vincent, you will 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

* 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.

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 stands nearly on the extreme West end of St. George's, and is considerably larger than the hummock of bushes before mentioned: and this hummock of palmettos, when bearing N.E., and distant so far that you cannot see the beach, appears as separated from the other land, and to form an island by itself; but when bearing N.W. it 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.

Cape St. Blas light-house was destroyed in the hurricane of 29th August, 1856. It will be rebuilt immediately. *Light.*

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 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 2 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.

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. Andrew's; 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. ANDREW'S is covered by Crooked and St. Andrew's Islands, which comprehend between them and the main, St. Andrew's Sound, which leads into the bay. *Bay of St. Andrew's.*

There are 3 entrances into this bay; the Eastern is through the opening between Crooked and St. Andrew's 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. Andrew's Island; the depth 21 feet, and the channel 200 yards wide. The Western entrance is about 2 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. Andrew's Island.

N.W. by W. from St. Andrew's 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 obstructs 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 breath 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 2 miles from the bar. The other part of the bay is full of shoals and palisadoes, navigable only for boats. *St. Rosa's Bay.*

From St. Rosa Bar to the Western end of St. Rosa 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. PENSACOLA LIGHT-HOUSE is on an eminence, about 40 feet high, and directly N. by W. from the bar, about half a mile North-westerly from the West point of St. Rosa Island. The light is revolving, each revolution 1 minute and 30 seconds, and is 79 feet above the sea.

Fort McCrea light. FORT McCREA LIGHT.—A light-house will shortly be built on Fort McCrea; it will be fixed.

Pensacola. 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 nowhere 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 3 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 2 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 1¼ mile 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 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 draught 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 4 or 5 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 daylight, 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.

Other Directions for Pensacola.—Run along the coast in from 6 to 7 fathoms water, until the light bears N. by W.; then steer direct for it. In crossing the bar, you will have from 3 to 3½ fathoms in the best water. After you cross the bar, and deepen the water, you must haul more to the Westward, and keep the port shore best on board, to avoid the *Middle Ground*, on which are not more than 7 feet water at low ebb; this you leave on your starboard hand. After passing the Middle Ground, steer N. by E. ½ E., and anchor within half a mile of the North shore, in 3 fathoms water.

The course from Mobile to Pensacola is E.N.E., distant about 38 miles.

From Pensacola to St. Joseph's the course is E. ¼ S., distant 95 miles.

The coast from Pensacola to St. Andrew's is very bold, and you may keep within half a mile from the shore.

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.—On Mobile Point there is a revolving light, 58 feet above the ocean level, revolving once a minute. 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 fixed light, 55 feet high. *Mobile Bay light-house.*

A new tower, 150 feet above the sea, will shortly be built for Sand Island light, and, when ready, the Mobile Point light will be reduced to a small harbor light, to serve with the ranges now there for entering. *Light-house Beacons.*

On the South point of Sand Island is a lighted beacon, which, in range with the light-house, leads over the bar in the best water. On the East point is also a beacon which, in range with the first, clears the West bank to the Northward.

Two beacons are erected at Mobile Point, one showing a fixed red light, and the other a light of the natural color. The two in range lead up along the edge of the East bank. The last in range with Mobile Point light leads to the upper striped buoy and through the channel at West end of the Middle Ground.

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 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 a fixed light, 45 feet above the sea, on Choctaw Point, a little below the city of Mobile. *Light.*

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 until 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. *Beacon.*

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 light 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 port, from which an extensive shoal makes in every direction. Within the bar are 2 buoys, the first to be left on the starboard, and the second on your port hand. The channel up thence is deep and plain, Mobile Point light-house bearing between N. and N.N.E. The tide rises 2½ feet.

Tide.

Other Directions.

Other Directions for Mobile.—Bring Sand Island light to bear N.W., and run direct for it, until within one-quarter of a mile of the light; then bring Mobile Point light (which is a revolving light) to bear N. by E., and run for it, leaving it on your starboard hand about one-eighth of a mile distant; you may then steer N. ¼ W. up the bay about 25 miles; you will then obtain a pilot over Dog River Bar, and up to the city.

In running in for Sand Island light, you will cross the bar in from 2½ to 3 fathoms water. After crossing the bar, should you have the wind *ahead*, you must not stand further to the Westward than into 6 fathoms water, or to the Eastward in less than 9½ fathoms.

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 2 or 3 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 by oyster-beds, presents three shallow passes, viz.: Pass Aux Huitres, with a depth of 3 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 Petit Bois Island. The entrance between these two is one mile wide, and the depth of water 5 feet. Petit Bois 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 Petit Bois and Horn Islands is 2 miles wide, and vessels drawing 9 feet water can enter it. The length of Horn Island is about 15 miles. There are some groves on it, but at the Eastern part it is entirely barren. There is no light-house on this island.

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.

Ship Island Light.

On the West end of Ship Island there is a fixed light, 54 feet above low-water.

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. Light.

Cat Island is the last of the chain extending to the Westward, and forming the Sound. On its Western point there is a fixed light, 39 feet above the sea, and on the main-land; bearing nearly N.W. from the former, there is another fixed light, 42 feet above the sea. These two lights indicate the passage 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 nowhere 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 Petit Bois and Horn Islands, and shape their course for the main entrance of Mobile Bay. Lake Pontchartrain is separated from Lake Borgne by Pine Island, to the North of which is the entrance called Rigoletts, and to the South called the Chief 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 Bayou St. Jean, which connects the city of New Orleans with the lake.

Bayo St. Jean, on Lake Pontchartrain.

BAYO ST. JEAN, on LAKE PONTCHARTRAIN.—To enter the Bayo, 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.

Light.

The light is a small fixed light at the mouth of Bayo St. Jean, elevated 39 feet above the ordinary surface of the lake, and can be seen in a clear night about 8 miles. It is 25 miles S.E. by E. ¼ 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.

South, 15 miles from Dog Island, is the North point of the Chandeleur 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.

Light.

On the North end of the North Chandeleur Island, there is fixed light 55 feet high.

Chandeleur Islands.

CHANDELEUR ISLANDS.—From Passe à 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 Chandeleurs. There is a good passage inside the Chandeleurs, with 8 to 11 feet water, but a good pilot is requisite. From Isle au Breton a shoal stretches 2 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 Chandeleur Islands are very low, with some myrtle-bushes upon them, and form a chain of coast very dangerous, not only because 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 a good shelter for all ships to the Westward of the North extreme of the Chandeleurs, called Naso Road, or the Road of Naso. 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 draught 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 Chandeleurs, and almost the whole coast of the Mexican Gulf, you can get water by digging wells in the beach, but there is no wood on the Chandeleurs but the drift logs left in abundance on the beach.

Naso Road.

North-westerly of the North extremity of the Chandeleurs, 14 miles distant, is Ship 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 Dog, 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 Petit Bois 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, has 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. 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 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.

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 wind Easterly, which is the prevalent wind, 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 latitude of 29° 30′, or thereabouts; and if bound to Pensacola or Mobile in the latitude of Cape St. Blas.

Should you strike soundings in latitude 29°, steer N.W. by W. awhile, so as to make its bearing W. Southerly, to prevent falling into the Southward of its parallels, especially in winter, when it is best to run heading for the middle of the Chandeleurs: 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 Chandeleurs, 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 10 or 12 miles.

But, in running 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 the Chandeleurs; and if you get coarse sand, with gravel, small stones, and large shells, you will be in front of the Chandeleurs. From the Balize to the Westward, the bottom is gray mud.

When looking for the Balize, either in its parallel or that of the Chandeleurs, you must take care not to get foul of the land at night, but maintain your position, in 15 or 20 fathoms, at anchor or under way; 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 Chandeleurs, 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 the 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 Chandeleurs, 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 à 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:—

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 Chandeleurs, 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 Chandeleurs, 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 Chandeleurs, 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 to the Southern board to S.W. It is also necessary to ad-

vise, 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. *Lights.*

Lights at the entrance to Mississippi River.

Pass à l'Outre light is a fixed light, varied by flashes. 77 feet above the sea, situated on Middle Ground Island, North side of the Pass. The tower is painted black. *Lights.*

Large nun buoy outside the bar bears E. ½ S.; from this buoy run for the spar buoys, and pass between them directly up the Pass. The channel between the spar buoys is very narrow.

On Frank's Island, North side of the Pass, it contains a fixed light, elevated 78 feet above the level 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. *N. E. Pass light.*

Pass à l'Outre light bears 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.

South Pass light is a revolving light, 59 feet above the sea, situate on S.W. side of Gordon's Island, in lat. 28° 59′ 42″ N., long. 89° 07′ 24″ W., N.E. Pass light bearing N.E., 22 miles distant. South-west Pass light is a fixed light, 70 feet above the sea, in lat. 28° 58′ 30″ N., long. 89° 20′ W., on the West side of the Pass. There are two wing lights on the tower, 23½ feet below the main light. A new tower will shortly be built for this light, about 3½ miles nearer the sea than the present one.

Directions for the Mississippi, and to prevent falling to the Westward.

After passing the Tortugas, make a N.W. course good, and you will fall into the latitude of the Balize, 20 leagues to the Eastward; keep on to the 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. Should the weather be thick, keep in 16 fathoms, and you will fall in on Pass à 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 4 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 by this Pass, these delays may, in 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 on Frank's Island; 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 South-westerly: the anchorage is good everywhere, 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 Pass à 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 9 fathoms, observing to keep the lead going. Being off Pass à 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.

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.

Currents.

CURRENTS.—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 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 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 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 a proper latitude before he comes within the influence of its current, it is not necessary to say any more on the subject.

Entrance of the River.

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° 04′ N., you will strike soundings in 45 or 47 fathoms, soft mud, the Balize bearing W. ¾ S., 21 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.

Coast west of the Mississippi.

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 which is the entrance to Barataria 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 Barataria Bay. The course from the S.W. Pass to Barataria bar is W.N.W., and the distance 35 miles. In navigating between Timbalier Island and the S.W. Pass, you should not come into less water than 4 fathoms. The coast to the N.E. of Barataria 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.

Light-houses are in course of erection at the entrances to Timbalier and Barataria bays.

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, 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 anchor as close to the island as you please. W.S.W. from Cayo Island, 1½ mile distant, is another island of about 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 the 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., 18 miles distant from Racoon Point, lat. 29° 01′; 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.

A light-house is now in course of erection on Ship Shoal. *Light-house.*

A LIGHT-SHIP, showing 2 lights, lies near the West end of the shoal, in 5 fathoms water, bearing N.N.W. from the wreck of the steamer Galveston, and about a mile to the Northward of the West end of the shoal. *Light-ship.*

She bears S.W. by S. per compass from Racoon Point, distant about 12 miles, and is anchored in soft mud.

She is in about lat. 28° 50′ N., and long. 91° 05′ W., and may be seen in clear weather, at night, 6 or 7 miles.

Vessels should not pass between the light-ship and the shoal, as the water suddenly shoals from 5 fathoms to 2 or 3 feet.

Vessels drawing 5 feet may anchor under Racoon Point, by bringing it to bear North, and running for it, 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.

POINT AU FER LIGHT is a fixed light, elevated about 70 feet above the level of the sea, lat. 29° 19′ 30″ N., long. 91° 22′ 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. *Point au Fer light-house.*

From S.W. Pass to Belle Isle.

On leaving S.W. Pass, steer W. ½ S., about 15 leagues; this course will carry you in 7 fathoms water off Timbalier; the coast from thence to Racoon Point, a distance of about 13 leagues, may be approached within one mile. S.E. by S., 16 miles distant from Racoon Point, is the West end of Ship Island Shoal, of 2 feet, on the Eastern end; it is 18 miles in extent in an E. and W. direction. It is always safest to pass between the shoal and Racoon Point, keeping the lead going. Give the point a berth of 3 miles, and you will not have less than 2 fathoms water. The course from hence to Point au Fer is about N.W. by W. ½ W., distant 9 leagues. It is best to keep the lead constantly going, and approach as near the land as your draught of water will permit, say 10 feet, to avoid running past the light, as in hazy weather you can scarcely see the light in 2½ fathoms water; latitude of the point 29° 19′ 30″ 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 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.

ACHAFALAYA BAY AND RIVER.—When you pass Racoon Point, steer W. by S. 3 miles, and you may then haul up N.W. ½ W. for the Point au Fer; you will cross the bank in 7½ feet water, when you bring the light-house to bear E. by N.; steer N. 69° 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. ½ 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 dependence can be placed on them, as vessels in coming up or going out often pull them adrift.

Achafalaya Bay. Floating light.

ACHAFALAYA BAY.—A floating light has been moored at the entrance of Achafalaya Bay. The vessel is painted black.

Point au Fer	bears	E. 22° South, distant 12 miles.
Belle Isle	"	N. 33° East.
Tucka Hummock	"	N. 22° West.
Turn Stake	"	N. 5° West, 1½ mile.
S.W. or Outer Stake,	"	S. 38° East.

Directions.

DIRECTIONS.—Bring the floating light to bear N.W. ½ W., and run directly for her. You will leave the outer or S.W. stake on your port hand. When up with the light-vessel you must anchor near her on the N.E. side, as you cannot proceed further without a pilot, or until daylight. At full sea there are 12 feet water in the channel.

Vessels bound for the Cote Blanche, after passing the barrel stake, must steer for Rabbit Island, until Deer Point bears North, then steer for it till up with it, thence N. by W. ½ W., until up with the Canal of Bayou Salé; here vessels anchor.

Marsh Isle Light.

MARSH ISLE.—On the Western end of this island there is a revolving light, 90 feet high, showing the entrance to Vermilion Bay.

From Point au Fer Westward.

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 60 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 from behind them Vermilion Bay, which communicates with the sea at 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. ¼ 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 two 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: 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 3½ 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. ¾ S.	distant 33	leagues.
To clear the shoal of do	W. by S. ¼ S.	" 33	"
To Pass del Cavallo	W. by S.	" 120	"
To Aranzas Inlet	W. by S. ¼ S.	" 132	"
To Corpus Christi	W. by S. ½ S.	" 140	"
To Brazo de Santiago	S.W. by W. ¼ W.	" 149	"
To Rio de Tampico	S.W.	" 205	"

COAST 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.

LIGHT-SHIP.—There is a light-ship moored inside Galveston Bar, showing one light, 35 feet above the sea. *Light-ship.*

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 4 channels. *Galveston Bay.*

GALVESTON LIGHT is a fixed light on Point Bolivar, on the North side of the entrance to this harbor, in lat. 29° 22′ 02″ N.; long. 94° 45′ 33″ W., bearing N.W. ¼ W., 4¼ nautical miles from the bar. The tower is white, and has an elevation of 76 feet above the level of the sea, and in clear weather is visible about 12 miles. *Galveston light.*

Masters of vessels bound for this port, and unacquainted with the coast, should keep as near the latitude of the bar as possible, and should not approach the land near this entrance in less than 6 fathoms. Vessels having to wait outside for a pilot should come to in 6½ fathoms, with the light bearing N.W. by W., or if standing off and on should be careful not to get to the Westward of this bearing.

When up with the bar, in from 3½ to 4 fathoms, bring the light-boat to bear N.W. ½ N., having Sanderson's House, on Bolivar Point, just open to the left of the light-boat; steer then for the light-boat, crossing the bar in 12 feet water, passing buoys on the starboard side, which will give the best water.

When up with the light-boat, steer N.W. by W. until the North buoy of channel is on with the North point of Pelican Island, then run for this buoy until the South buoy opens the South end of Pelican Island; then haul up for the South buoy, which must be passed close on the port side if the tide is flood, but if ebb, give it a good berth.

Having entered the harbor, bring the red belfry of the market-house on with a low square frame tower, the next to the Westward of the Episcopal church, for the mid-channel.

The anchorage inside the light-boat in 4 fathoms is always safe. Strangers must beware of the currents, which are very strong, and in the channel-ways the water shoals very suddenly. Good pilots are always in attendance on the bar. Vessels compelled to anchor outside may do so in 6 fathoms with perfect safety during all seasons. At times, as during a very dry season and heavy Northers, the water on the bar may be assumed at one foot less than is exhibited on the chart. S.E. winds cause a full tide on the bar. There is generally but one tide in 24 hours, which rises about one foot.

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 until up with the point, which pass within 100 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, until you see a small bunch of bushes about 2 or 3 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 3 single trees about the middle; at the West 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, 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 6 feet water can enter the river without difficulty. No permanent directions can be given for this port, as the bottom is quicksand and constantly changing. Vessels drawing 9 feet and *Velasco.*

over should not cross the bar unless signalized by a pilot to do so, or having one on board.

S.W. from the mouth of the Brazos 12 miles, is the entrance to Bayou 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 Bayou 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 bayou about 8 miles from St. Bernard. This bayou has a range of woodland which runs nearly to the beach, at the end of which is the bayou. After passing this, the land is low all the way, and you may keep in 3, 6, and 7 fathoms.

The following Beacons and Buoys are arranged in regular order as they are passed by vessels entering Galveston Bay.

Buoys.

Can buoy, white and black perpendicular stripes; outer buoy on bar—bearing South-east from light-ship; 15 feet water—may be passed on either side.

Can buoy, white and black perpendicular stripes; inner buoy on bar—bearing South-east from light-ship; 14 feet water—may be passed on either side.

Can buoy, temporary, black; light-ship buoy, in light-ship's berth; 20 feet water—leave it on starboard hand.

Spar buoy, No. 2, red; North buoy, bearing West from light-ship; 12 feet water—leave it on the starboard hand.

Can buoy, No. 1, black; South buoy on Knoll—bearing West ¼ South from light-ship; 12 feet water—leave it on the port hand.

Can buoy, No. 4, red; Pelican Spit buoy—bearing South-west from South buoy; 12 feet water—leave it on the starboard hand.

Can buoy, No. 5, red; City Buoy—bearing North from Commercial Wharf; 10 feet water—leave it on the starboard hand.

Spar buoy, No. 3, black; Half-moon buoy—bearing East by South from Half-moon fixed light; 9 feet water—leave it on the port hand.

Spar buoy, No. 5, black; Dollar Point buoy—bearing North from Half-moon Shoal; 9 feet water—leave it on the port hand.

Matagorda light.

MATAGORDA LIGHT is a revolving light, on the East end of Matagorda Island. The tower is white, black, and red, and is distant from the Bar 3¼ miles. The light is elevated 72 feet above the level of the sea, and revolves once every 1½ minute. The tower is in lat. 28° 19′ 30″ North; long. 96° 22′ 00″ West. Vessels bound into Matagorda Bay, and having to wait outside for a pilot, should come to in 7 fathoms, the light bearing W.N.W.

Matagorda, or Pasa Del Caballo.

MATAGORDA, or PASA DEL CABALLO.—The entrance of Matagorda Bay lies between a long peninsula without trees, which begins at the river Carney, making Westward, and covering the Bay of Matagorda. Its termination forms the Eastern entrance, and is called Deckrose Point, having a custom and several other houses on it. The East end of St. Joseph's Island forms the West point of entrance, and presents a higher ridge of land, (covered partially with grass,) than any part of the coast for 60 miles East or West. The pilot's house is on this point. In coming from the Eastward you must keep in 6 fathoms water, until this point bears N.N.W. Then keep the pilot-houses just open to the Eastward of the high ridge, which will bear N.N.W. to N.W. by N., and standing thus, you will cross the bar in 9 feet, according to tide; when you will steer for the point of St. Joseph's, North-easterly of the pilot-houses; having the best water close to the breakers, along the West shore—until the houses on Deckrose Point bear N.N.E., you will steer up for them, and have a sand island on your starboard side, with breakers extending from it to the bar, and to Deckrose Point; from which some spots of sand extend towards the channel. You must keep your lead going to avoid them; and you will find 4 or 5 fathoms when up with the point, where you may anchor within a cable's length of the custom-house, or proceed up the bay. The channel from the bar to Deckrose Point is well defined, and the distance 6 miles; but in approaching the point, a large middle ground lies on the Western side of you, to which come no nearer than 2¼ fathoms.

Breakers.

Buoy.

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 15 to 80 yards.

Eleven feet can be carried in at the top of high-water, and plenty of room inside, with good anchorage, in 4 fathoms.

From Pasa del Caballo to Aransas Pass 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, with 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.

ARANSAS PASS.—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 as soon as you have passed it, and take your soundings in 10, 11, and 12 feet; or you may anchor as soon as you have passed 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. *Aransa Pass.*

South of Aransas 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 further 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.

BRAZOS SANTIAGO.—There is a fixed light, 82 feet above the sea, at Point Isabel, Brazos Santiago. The light bearing W. and N. per compass, may be seen from the deck of a steamer at the distance of 11 nautical miles from the bar, and may be safely approached on that course until in 8 fathoms water. It may be seen in any direction to the seaward, at the distance of 15 nautical miles from Point Isabel, but intervening land renders it necessary to be cautious in running for the light. A beacon light, intended to mark the entrance of the harbor, will also be exhibited at the Southern point of Padre Island, which may be seen at the distance of 10 miles, in clear weather, from the bar. The tower of the light-house is painted white, with a black lantern and dome. The beacon is a movable frame-work structure, painted black, and plainly discernible by day. The light-house is in lat. 26° 07′ N., long. 97° 16′ W.; the beacon in lat. 25° 06′ N., long. 97° 12′ W. *Brazos Santiago light.* *Beacon.*

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 2 to 3 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. *Current.*

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. *Current.*

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. *Signals.*

A red flag will be hoisted to know your draught 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. 100 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: a 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, 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 the land.

Current.

The course from the S.W. Pass to Barataria 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 40 miles, until in the latitude of its entrance, as you will by that have no current to hurt you; but, on soundings and inshore, 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 once 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.

Current.

Tide.

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.

Water.

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 Santander. The land from River S. Fernando to Bocas Ciegas is low.

S. ½ W., about 24 leagues from Bocas Ciegas, is the entrance to the River Santander; 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 a part of 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 Santander 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 3 leagues to the South of Santander, where they extend 2 miles from the coast; on the Barra del Tordo there are scarce 3 feet at low-water.

Rocks.

The marks for crossing this bar are those double hills called the Martinez; they lie West from it, and to the N.W. of Martinez in the interior you can see the range of high land called Tamaulipas 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. ¼ 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, 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 good; 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 and 10 in the morning, when they yield to the sea breeze; but this only takes place as high as 26½° of latitude, where the mountain range terminates; all the other parts are very flat, low, and swampy. *Current.*

We will now resume the the description of the Gulf, commencing with Cape Catoche and ending with Tampico.

GULF OF MEXICO.

In this Chapter the bearings are 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 Caribbean 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. *Gulf of Mexico.*

CAPE CATOCHE TO POINT XICALANGO.—The N.E. land, or Knee of Yucatan, has several islands at a short distance from it; these are Cancum, 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, 12 miles from Cape Catoche. *Cape Catoche to Point Xicalango.*

Cape Catoche has 2 islets along its shore, which extend out scarcely a mile from it, and form, with the Island of Jolvos, two mouths, called Joujou and Neuva, 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 50 miles, to Rio Lagartos, (Lizard River,) when it inclines W. 13° S., 35 leagues from 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 mound of stones, intentionally raised by the passing Indians on the beach of Lagortes, 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, finally, the Castle of Sisal. None of these Lookouts, (Vigias,) except the Cairn of Lagartos and Castle of Sisal, can be seen further off the shore than from 6 fathoms 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 vessels are in much danger of getting aground.

The Castle of Sisal is built on the shore, close to the sea, and near to it are 3 or 4 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. There is a fixed light on the castle, which can be seen 10 miles.

Light.

Upon Point Piedras there is a little mount, named No-te-perderas, (Do not lose yourself,) and which is seen from Sisal Shoal, or 14 miles off. From this point the coast rounds about to the S.W., for 30 miles, to Point Desconocida, forming the N.W. front of the Peninsula of Yucatan; this coast, as well as the former, may be seen from 5½ fathoms 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 Palmas no one should 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, 22 miles, to Las Bocas, (The Mouths,) which are two small inlets formed by the coast; in front and very near to them are two very small islets. From the Bocas, the coast continues to the South, with some inclination to the West, true, 25 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, 21 miles, towards the River of S. Francisco, which is 4½ miles N.E. of Campeche, the only point of commerce on all this coast.

The coast between Point Desconocida and the River of S. Francisco cannot be seen further 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 the hull of a sunken vessel, which lies to the West of the Isla Piedras, in 3½ fathoms water, to which vessels navigating in this depth ought to give a berth.

From the River of S. Francisco the coast continues to the S.W., 12 miles, to Point Morris, in which space the Castle of S. Josef is the first thing seen; afterwards, the city of Campeche; to it follows the Castle of S. Miguel; next comes the town of Lerma; after it a point of the coast extending out to the sea, and is named Point Martin; the next is Point Morros. All this front of coast, which forms the anchorage of Campeche, may be seen from 4¾ fathoms; but the water is so shallow that you will find 3¾ fathoms at 15 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 draught 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, and 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 North-west winds, which in the season blow with great force, there is not anything 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, four 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 San Felipe, (St. Philip.) Between this and Point Xicalango is the principal entrance to the lagoon, with rather more than 2 fathoms depth, difficult to enter, and it is absolutely necessary to have a pilot.

Soundings, or Bank of Campeche.

THE SOUNDINGS, OR BANK OF CAMPECHE.—The Campeche Bank is a great bank which extends from the North coast of Yucatan as far as lat. 23° 50′, 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.

The quality of the soundings, from 18 fathoms towards the shore, is irregular; sometimes it is gray sand with gravel, at others, gravel alone, and at others, sand with shells and coral, until to the N.W. of Point Piedras, where the soundings are on stone or rock, making 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 Baxo Nuevo, which is the channel to be preferred for running off the bank on its Western side.

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 nearly W. by N., 83 miles from Campeche. They form of themselves a good harbor, which may be entered on the N.W. or S. side, 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 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 island N.W. ¼ W., nearly half a mile, and which forms the true channel between that and the Westernmost island, 2 cables' length in width. *The Arcas.*

The Westernmost island has reefs to the W.N.W. and W.S.W.; also at 2 and 1½ cables' length from the North point of the large islands there are three foul reefs extending to the West, the furthest of which is 4 cables' length from the said point. This anchorage is very superior in Northerly gales to that of Campeche, as there is deph in it for all classes of vessels, and it is well sheltered and secure.

The S.E. Arca is surrounded by reefs, separated from it about a cable's length. 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 centre of the Arcas is in lat. 23° 13′ N., long. 91° 59′ 4″ W.

CABEZO, we believe, does not exist. *Cabezo.*

THE BISHOPS are two shoals of 2½ and 3 fathoms. The South Bishop is in lat. 20° 26 N, long 92° 14′ W.; the North Bishop is in lat. 20° 30′ N., long. 92° 13′ 30″ W. *Bishops.*

TRIANGLES are two groups of keys. The S.E. Triangles are two islets 2 miles distant from each other, but connected by a reef. On the S.W. key there is a beacon 35 feet high. The bank has an extent of 3½ miles in a N.E. and S.W. direction; the centre is in lat. 20° 54′ N., long. 92° 14′ 30″ W. *Triangles.*

The N.W. Triangle, on which there is a beacon 38 feet high, is in lat. 20° 58′ N., long. 92° 18′ 30″ W. There is a channel 5 miles in width between the N.W. and S. E. Triangles, 28 fathoms water.

BAXO NUEVO.—This dangerous shoal lies in lat. 21° 51′ N., and long. 92° 6′ W. It is about two cables' length in extent, being a small key surrounded by rocks, the sea breaking frightfully over all. On this there is a beacon 35 feet high. *Baxo Nuevo*

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 deposit 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, which is 20 feet above the sea. 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 in with a Westerly wind. Vessels should anchor under the windward reef in 6 or 7 fathoms, in preference to this cove, and will have sufficient room to get under way should the wind come from that quarter. Light variable winds and calms generally precede them. *Key Arenas.*

The channels between the reefs are distinctly seen from aloft in clear weather. Run with the extreme West end of Key Arenas bearing N.N.W. ½ W., until Stony Key bears N.E. by E.; haul up, and choose your anchorage in 10, 7, or 5 fathoms, observing that 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 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. *Tides.*

ALACRAN.—A vessel drawing 11 feet may pass over the rocky heads between Perez and the South Spit, which make the entrance intricate, and with the wind to the South of East, which it generally is in the morning, or rather before noon, a vessel *Alacran.*

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 around 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 6 fathoms and a half, coral sand, is safe with all but Westerly winds, which are rare, and give timely warning of their coming.

Tide. The tide, if it can be so called, is very irregular, varying in rise and fall from 7½ to 26 inches. The fishermen are supplied with water from the main land; a proof that it cannot be procured at Alacran. The dampness of the atmosphere is remarkable; and the fog in the morning is 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 ascent 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 gray, white, and yellow, is much 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 1½ knot per hour. The high North bore is 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. Turtle are also plentiful.

The Alacrans are in 22° 32′ 15″ N. latitude.
" " " 89° 43′ 00″ W. longitude.

ISLAND BERMIJA does not exist.

THE NEGRILLO does not exist.

Sisal Shoal. 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 9 feet, and it is about ¾ of a mile in a N.N.W. and S.S.E. direction. In the channel between it and the shore, there are not more than 7 fathoms, with tolerably regular soundings.

Madagascar Shoal. 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 9 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., 10 miles, there are 10 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 Captain Barnett, R. N.; the longitudes are further to the Westward than laid down in the charts, but we prefer his as more authentic.

To Campeche. TO CAMPECHE.—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 inside of the shoal of Sisal, or outside of it; but in fine weather it is preferable making the land to the Eastward, and running 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 to 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 on which 2½ fathoms only are found, lying 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 latitude 19° 49′ N., and longitude 90° 33′ 30″ 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, in 5½ fathoms, in lat. 19° 56′, 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 one mile, and as soon as you again have 2¼ fathoms come to anchor. When you have 4¾ fathoms, the steeples of Campeche are just in sight from a frigate's deck; and when in 4½, the church at Lerma can be seen from the deck. Point Morris, 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 best depth 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, in lat. 19° 53′ 47″, and long. 90° 37′ 30″ W. Should your ship be of less draught of water than a frigate, proceed on for fort St. Michael, keeping it bearing as above, and anchor in what dedth 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 is common on this coast in the forepart of the day, proceed as follows: After you reach the latitude of 20° 0′ N., haul up 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 lat. 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 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 3 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 the water is not good.

The tides are 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 further into deeper water

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.

PORT LAGUNA.—The port of Laguna, or town of Carmen, as it is called by the Mexicans, lies on the West end of the Island of Carmen, 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 lat. of the point is 18° 38″ N., and long. 91° 49′ W.; 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 en-

trance, 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, and 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 Carmen 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, 3 miles distant, then steer for it, but keep your lead going, and come into 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, as 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 are 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 rivers Tabasco, 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 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 San 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 Anna, distant from the former 31 miles, S. 52° W.

All the coast from Xicalango to Santa Anna is clean, from the Lodazar to Chiltepec there are 4 or 5 fathoms at a mile from the shore, and 10 miles between Chiltepec and Santa Anna: the quality of the bottom between Lodazar and Chiltepec is mud; between Chiltepec and Dos Bocas, mud and rotten shells; from Dos Bocas to Tupilco, coarse olive-colored sand; and between Tupilco and Santa Anna, 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 Anna with mangroves and miraguanos.

From the bar of Santa Anna West, 25 miles, is the River Coatzacoalcos, and in the immediate space the River Tonala discharges its waters.

At the distance of 13 miles West from this bar is that of the River Barrilla, which, with the River Coatzacoalcos, 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. 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.

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 Anna 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.

N. 27° W., at about 4 leagues distant from Point Anton Lizardo, is the Castle of San Juan de Ulloa, 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 roadstead, covered with several islands, on one of which the fortress of San Juan de Ulloa is erected.

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 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. Its height is 17,886 English feet 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 15,992 feet 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.

TABASCO—The bar of Tobasco River, may be considered passable at all seasons of the year for vessels drawing 10 feet water; though there are times immediately after a Norther, when there is as little as 8 feet; but in one or two days the current of the river wears the channel to its usual depth. *Tabasco.*

The water is deepest during the months immediately preceeding the season of North winds, when the current of the river has had a long time to act in clearing out the channel on the bar.

The water in the river is highest, and the current more rapid during the rainy season, when a single Norther has been known to bank the bar up from 10 to 8 feet water.

No vessel should load inside deeper than to 10 feet draught, or they may have to wait a month before getting out.

The pilots are good, and keep a good lookout for vessels approaching, getting on board in good time.

RIVER COATZACOALCOS 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 $\frac{1}{10}$ miles, 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 flagstaff 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 bar, the depth of which is 2¼ fathoms, increasing as you pass it from 7 to 13 and 15 fathoms. *Coatzacoalcos.*

Sailing-vessels bound for the Coatzacoalcos, ought to make the land to the Eastward. This precaution is necessary on account of the prevailing trade-winds, which cause a strong Westerly current; also, in case of a Norther to have the advantage of sea-room. The entrance to the river may be known by the tower, situated upon the Western side, likewise from the sand-cliffs extending from that point to Westward.

The best mark for crossing the bar is to bring the tower to bear S. ¾ W. by compass. Having passed the bar, haul up to the Eastward of South, and steer in midway between the two points that form the entrance to the river. The wind after crossing the bar often falls to calm; for this reason it is necessary to have the anchor ready to let go, as the current on the ebb, even in the dry season, sets out strong.

The extent of the bar, East and West, is about 220 fathoms, and the width by actual measurement 108 feet. The bottom, composed of sand and clay, is hard, on which account it is not liable to shift. At high-water, on the full and change, the depth is about 13 feet, and falls as low as 11 feet. The general depth, however, is 12

feet, from which in sailing it deepens gradually to 5 and 6 fathoms, except in heavy Northers there is a regular land and sea breeze; the latter sets in between the hours of 9 A.M. and noon.

Buoys. Two spar buoys were placed on the bar of the Coatzacoalcos River, in 11 feet water, half-flood. Between them the depth was 12 feet at the same stage of tide. The one to the West was red, and that to the East white. The bearing of the old tower from the channel is about S. ½ E.

These buoys were moored with heavy chains and iron weights; and they ard not now in their places, July, 1857.

The quality of the bottom of the bar is hard sand. The sea, in heavy Northerly gales, breaks quite across the channel.

No vessel drawing over 11 feet ought to attempt to enter the river, although at times 12 feet water may be found on the bar. On all occasions, with the aforesaid draught, it must be full flood with a smooth sea.

A pilot resides near the entrance of the river, who can be obtained by vessels arriving off the bar, having a flag flying at the fore.

A black spar buoy, also with heavy iron moorings, has been placed on the S.W. extremity of a ledge of rocks, 3 to 4 feet under water, in the Coatzacoalcos river.

This ledge is situated towards the Eastern bank, a little above a branch of the river which is on the Western bank, and is called "Rio del Terra Nueva de los Colazedos."

Alvarado. 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 Coatzacoalcos, will admit vessels of 9 or 10 feet draught. 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 draught 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.

The anchorage, after you are in, is good, and about 2 miles from the bar, directly opposite the town.

Anton Lizardo. ANTON LIZARDO.—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.

Sacrificios and Green or Verde Island cannot be mistaken; therefore bring Green Island to bear N.W. by N., and steer S.E, by S., (compass bearings,) this will carry you in sight of Blanquilla, a shoal which breaks. When you are 2 miles from Green Island you can see a blank on the hills on your port bow—there are a number of patches, but this is the largest and most Southerly—steer for it. As you approach, you will observe the houses and lime-kiln on Anton Lizardo; steer for them, keeping them open on the port bow until you are near Blanquilla shoal. As you pass in, keep a cable's length from the light green water, the shoal on your port hand. You will be steering about S.E. by E., doubling to E. ¼ N. You will now be one mile from the beach, where there is a breaker extending from 300 to 400 yards towards Blanquilla. Here your eye and lead are your best guide. Do not go in less than 6 or 8 fathoms on

the Blanquilla side of the channel. If you shoal your water, steer towards the shore, and you will deepen from 8 to 16 fathoms, and from 16 quick to 8 and 2 fathoms. The channel is half a mile wide at least. As soon as you pass Blanquilla, or as soon as it is on with Salmedina, which is the Southern and Eastern island, you can haul up gradually to the Eastward, steering where you please. Blanquilla bears W. ½ N., and Salmedina E. ½ N. from the ship.

The holding-ground is excellent, being formed of thick sand and clay; and from the 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.

Vera Cruz.

VERA CRUZ.—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 Ulloa, 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 3 or 4 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.

Light.

Vera Cruz light is a revolving light, on the N.W. part of the Castle of San Juan de Ulloa; it is bright 6 seconds, then dim for 40 seconds.

In running for this port, you should 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 look-out must be kept for the light on the port 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 daylight, in getting sight of the town, steer for it, observing the following directions:

Before you approach nearer than 3 or 4 miles of the town, to 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 a 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, and from 10 to 5 fathoms; and when you are so far as to bring the S.W side of the square building that the look-out 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 look-out 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 S. side of the castle, in from 5½ to 4½ fathoms.

During the months of November, December, January, February, and March, 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, you should moor 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 the 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 hawser to the Eastward.

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 the 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 Ulloa, 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. There is a good anchorage, the fort bearing N.E. by E. ½ E., 600 yards distant. This position may be taken by running to the Southward of the castle, between the shoals of Galleguilla and Blanquilla, which always show themselves, and round the Gallega Reef, in 5 fathoms, until you bring the bastion of San 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.

Vera Cruz. VERA CRUZ, *from the French.*—To enter into the Port of Vera Cruz by the best passage, it is necessary to follow the range of the steeple of S. Francisco and the square tower of the Parochial Church, and as soon as you have brought the bastions of S. Pedro, S. Crispin, and Fort Ulloa in a range one with another, steer immediately for Point Hornos, and approach little by little the curtain to the South of the fortress, under which the ships are ordinarily anchored.

If you wish to enter by the East passage, you take first the line of the steeples of Merced and of Santiago, and when you have reached the line of the two bastions already mentioned, you steer for Fort Conception, then direct towards the curtain South of the Fortress, as soon you come to discern the middle.

The best anchorages near Vera Cruz are to the S.W., and near the Island of Sacrificios, in 8 fathoms; or to the South of the Island of Verte, 13 and 14 fathoms, muddy bottom.

Between Pajaros and the Island of Sacrificios there is a good shelter from the North wind, but only for a small number of vessels.

Tide. There is but one tide in the 24 hours; its movement is very irregular: during summer, at full and change of moon, low-tide takes place in the evening, from 3h. to 7h., and high-tide in the morning, from 7h. to 9h. In winter it is to the contrary, low tide takes place in the morning. In the quadratures these two incidents of the falling and rising of the sea take place at the middle of the day and midnight. The greatest difference observed in the level of the waters is 2¼ feet.

Currents. During winter, and generally with the wind North-west to N.N.E., the currents run S.S.E. to S.E., and sometimes to E.S.E.; their greatest quickness is about 2 miles an hour. In summer, and almost always when the wind is from the East, they direct themselves W.N.W., or to the N.W.; their greatest velocity is then about one mile.

Near the elevated land of Bernal and the point of Delgada, these currents are stronger, and are directed either to the North or to the South, according to the season or the most powerful wind.

During the squalls of winter, there are, at 20 leagues from the point of Delgada, currents which run between the N.E. and the N.W., obscure weather and continual rain, while near the coast the sky is frequently sufficiently clear to make the landing-places easy.

The Roadstead of Anton Lizardo offers, without exception, the safest anchorage; you anchor at the South of the reef of Chapas, where you find a bottom, the holding-ground of which improves the nearer you approach the Island of Salmedina.

You can occasionally anchor to the South of the reefs of Medio, of Cabeza, or of outer Anegada.

The upper part of the lantern of the light-house is 89 feet above the mean level of the sea. Longitude of the light, 96° 8′ 36″. Lat. 19° 12′. Variation, 8° 22′ E.

From Vera Cruz to the River Tampico. 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 further, 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 miles further, 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.

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 Tanguija, and thence it is 23 miles N. 10° W. to Cape Roxa, which, by observation, is in latitude 21° 35′ N., and 1° 14′ 45″ West longitude from Vera Cruz.

Between Cape Roxa 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 a 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 Loboz; 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, 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 S. 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., 13 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 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 lat. 22° 15′ 30″ N., and long 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 Martinez 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 of 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 ob-

tained. 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 Tamiagua from the sea.

Tampico Bar.

TAMPICO BAR is situated in lat. 22° 15′ N., and long. 97° 46′ 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, vessels should proceed 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 land-fall; but in the event of your not being able to get your latitude, and making your land to the Northward and 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 huts on the South side of the entrance. To the North of the river, in lat. 22° 23′, and 3 or 4 miles inshore, 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 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

Signals.

The following signals are made at the bar for vessels at sea:—

Two black balls at the yard arm of a small yard, placed horizontally from North to South, at the upper extremity of the mast that supports the signal-light, means that the bar is bad, crossed or not passable.

One black ball at the North yard-arm, means that the channel of the bar is in that direction, and that it is good or passable.

One black ball at the South yard-arm, means that the channel of the bar is in that direction, and that it is good or passable.

One black ball amid-ships of the yard, means that the channel is in the middle, and that it is good or passable.

Two black, with one under the other, ask the vessel if she wants provisions.

Two black balls at the South yard-arm, ask if she wants water.

When the vessel wants what is asked of her, she is to answer by hoisting her flag at the fore.

Light.

A fixed light will shortly be erected at Tampico, in latitude 22° 15′ N., longitude 97° 46′.

BERMUDAS, OR SOMERS' ISLANDS.

General Instructions for making the Bermuda Islands.

	Latitude.	Longitude.
St. George's Town, at the Eastern end	32° 24′ N.	64° 38′ W.
Wreck Hill, at the Western end	32 17½	64 52
S.W. Breakers	32 11	64 49
	Variation 7.01 W.	

There is a revolving light, 365 feet above the sea, on the Southern part of Bermuda, in latitude 32° 14′ N., and longitude 64° 50′ West, and in clear weather may be seen from the deck of a frigate 7 or 8 leagues. It is higher than the adjoining land, and in day-time will appear like a sail. It is visible all round the island, with the exception of an area of 10 degrees between S. 64° W. and S. 74° W. by compass, and within this area it will be intercepted by high land. *Light.*

Bermuda is always approached with more safety from the Southward, and in running for it at night or in thick weather, care should be taken not to get to the Northward of 32° 8′ lat., before seeing the light or the land.

In coming from the S.E. the light should not be brought to the Southward of W. by S., or approach nearer than 6 or 7 miles during the night. Coming from the Westward it should not be approached nearer than 10 or 12 miles until it bears to the Northward of N.E. by E.

With the light between N.E. and W., the coast is free from danger, and may be safely approached within 3 miles.

Any vessel getting sight of the light from the Northward had better haul off immediately, as the reefs extend all round from the S.W. to the N. and N.E., from 15 to 16 miles.

This light will show a bright flash, continuing for 6 or 8 seconds, and repeated once every minute. Between the flashes the light will be seen about 10 miles distant.

HAMILTON is at the West end of the island, and is the seat of government. *Hamilton.*

The North-west cut into Hamilton is called the "Chub Cut," and admits a draught of 18 feet. The South-west Cut into Hamilton is called the "Hog-fish Cut," and admits a draught of 20 feet.

There are branch pilots in attendance at the above stations.

A steamer is furnished from the dock-yard for vessels when wanted; the dock-yard is 7 or 8 miles from the cuts.

The winds in winter are mostly Westerly and North-westerly.

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. *Tides.*

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, no vessel ought to lie to, but should rather turn to windward under easy sail until daylight, because of a probable current, which is variable, and it is known that vessels have been carried by it out of their reckoning, and brought unexpectedly among the rocks. The land not being high, (for Gibbs' 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, steer for the American coast, in order to take a fresh departure for running down the latitude again.

The rocks and shoals 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, North-west, 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 Gibbs' Hill; trending thence N.E., it is called the Club Heads, which, off Wreck Hill, lie 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 to 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 the 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 2 miles from the shore round the N.E., E. 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 encased with tallow, for the greater certainty of striking ground. This precaution, would prevent many of the wrecks that constantly happen here.

There is a rocky bank lying from S.S.W. to S.W. from Gibbs' Hill, (S.W. part of Bermudas,) from 3 to 5 leagues distant. Various depths, from 17 to 45 fathoms, are on it.

The latitude of 32° 8′ N., being 2 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, not beyond 32°.

If bound to Bermudas from England, or from any part of Europe, a direct course should be steered as long as the winds permit; but the moment they become contrary, 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 2 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 until within one mile thereof, or until 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, do not come to the Northward of 32° or 32° 6′, in which latitude, if you have run past the islands, you must proceed as above described, in making them from the Westward. Heave to to the Westward of the islands.

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 where it affects your latitude more than longitude, and, of course, is 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 Club 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 more than half a mile off, and that generally visible; you may run safely along shore at a mile distance, 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 everywhere 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 until you are far enough to the S.W. to follow the directions before given for coming from the Westward.

You must make great allowance for being to the Eastward of your reckoning, and try to fall into the parallel of latitude above mentioned, in longitude 70° or 71° West.

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 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 gunshot 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 further to the Northward than to keep Cooper's Island open with St. David's Head until you get a pilot. *Other directions.*

N.B.—At St. George's, at the N.E. end of the islands, Pilots are always to be had.

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 vicinity, the currents are very uncertain, and much caution is necessary.

Vessels from the Eastward 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 Watling's Island, proceeding along the West side of it, 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 it above 7 miles.

Harbor Island lies in latitude 25° 31′; 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 brushwood, 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, as 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 on 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. 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 than steer in, giving the point of Hog Island a berth of about 80 fathoms, 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 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.

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 situated N. by E. ½ 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 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 star board 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 ancho r in 4½ 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 vessel drawing 18 or 20 feet of water, may proceed to the S.E. side of Rose Island, and anchor in a quarter less 5, at about 6 miles from the town of Nassau, well sheltered from N.W. winds, and from the S.E. by the bank.

Bearings. The direct bearing from the Hole-in-the-wall to Providence Bar, or light-house, is S. ¼ W., 15 leagues. The bearing and distance from the Hole-in-the wall to the pitch of Egg Island Reef, are S.E. ¾ 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 rock, &c.

Tides. At Nassau, New Providence, in the entrance of the New Anchorage, and in its channels, the tide runs at the rate of 4½ miles, and rises 4 feet at the springs, and the currents have much force.

Eleuthera. ELEUTHERA is one of the largest islands, and is of very irregular shape. Its North-west end bears N.E. ¾ N., distant about 14 leagues from the East end of New Providence; it thence extends South-eastward about 14 leagues to Palmetto Point; and, lastly, about S. ½ 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 on the bank. On the West side are the settlements of Rock Sound.

Guanahani, or Catt Island. GUANAHANI, OR CATT ISLAND.—The N.W. end of this island lies about 8½ leagues E. ½ 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 Catt Island. Between its N.W. end and Powell's Point, at the distance of 4½ leagues, S.E. from the latter, is the N.W. end of Little Catt Island, joining to Catt Island by a bank which surrounds both of them.

Between the South end of Eleuthera and Little Catt Island is a channel 3 leagues wide, called Ship Channel.

Long Island. LONG ISLAND, so called from being peculiarly narrow in proportion to its length, is 17 leagues in length from S.E. to N.W. The North-west end lies 8½ leagues South from Catt 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. EXUMA, &c.—The islands called the Great and Little Exuma, lie to the Westward of Long Island, and the Southward of Catt 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 called Exuma Keys; to these succeed several others in a more Northerly direction, to the distance of 8 leagues; the Northernmost, called Ship-channel Key, lies E. by S., 10 leagues from the East end of New Providence.

Between the bank which surrounds the Catt 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 further 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 called the Twelve Feet Channel.

Watling's Island. WATLING'S ISLAND, which lies 14 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 Hinchenbroke 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 Watling's Island, about 1½ mile from the sandy beach, with the S. by W. point bearing S.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 the same color as the ocean ; at this time land was distinctly seen from mast-head, bearing S.W., and very low."

Rum Key. 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 biscuit 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 Watling's Island, about 20 miles from Rum Key.

If the vessels returning homeward cannot pass to the Eastward of Rum Key, and are obliged to take to 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 roadstead 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-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 alongside in boats and put on shipboard.

Conception. CONCEPTION is a little island surrounded by a reef, and lies half-way between Rum Key and Catt Island. From its N. side a reef extends 5 miles to the N.N.E. and N.N.W., 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. 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 is about 3 miles, which is in the middle ; 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 2 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 before 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.

THE CROOKED ISLANDS.—Of this singular group the best idea may be formed by referring to the particular plan of them. The positions appear to be well ascertained; and particularly of Castle Isle, or South Key. Pitt's Town, a settlement on the N.W. part of the Northern island, is the port of entry.

Castle Island.

CASTLE ISLAND is an islet off the South end of Acklin, 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 is 22° 7′ 45″ N., and 74° 19′ W. 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

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 the 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.

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 Rock 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.

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 2 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 will 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 daylight for anything 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., 7½ 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 1½ 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 may consider yourself out of the passage; but should the wind happen to the N.E. or E.N.E., you have to fear Watling'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 Bank. DIANA BANK is a bank of 5 miles in extent from East to West, and 3 miles from North to South. From Com. R. Owen's, R.N., surveys, who has surveyed all the windward passages, it appears there are not less than 9 fathoms on it. The centre is in lat. 22° 31′ N., long. 74° 46′ W.

Currents. CURRENTS.—You have little reason to fear the currents in this passage, which, in a fresh breeze, are scarcely perceptible; 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 mind them, especially if you make it with a large wind. But 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, if you have sufficient to make you go more than 2 knots an hour, allow a quarter of a mile an hour for the current setting to the Westward; if you go 3 knots and upwards, this allowance will be unnecessary.

Winds. WINDS.—The N.E. trade generally prevails here, except from October to April, which are considered the winter months, during which 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.

Mira-por-Vos. The MIRA-POR-VOS, an assemblage of barren rocks, with one low sandy islet, lie 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 have always 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 10 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 brushwood."

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. *High-water.*

RAGGED ISLANDS.—These have been surveyed by Commander R. Owen, R.N. The flagstaff is in lat. 22° 11′ 40″ N., long. 75° 44′ 07″ W. If bound to them from the Windward Islands, a N.W. course from Cape Maize will make them, distance 45 leagues. Vessels bound to Ragged Island should pass 15 miles to the Northward and Eastward of Key Verde, thence steer W. by compass for Ragged Island. The island is surrounded by many dangers, whose positions are shown on the chart. All masters of vessels bound to it, in coming up the straits, had best 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 draught of water, keep the island under their lee, and run the shore close on board until they bring the flagstaff 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 on your starboard side; give it a berth, and in running in, you will observe a large red Cal Bank on your port 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 have met you on the outside. Ragged Island is distinguishable from all other surrounding keys by a lofty hill about the middle of it, the number of houses and inclosures, and by the flagstaff that appears on it. Vessels running far from Cape Maize, or Barracoa, generally make Cape Verde, close up to which, either to windward or leeward, there is plenty of water for vessels of any draft. South of Ragged Island, distant 10 miles, there are three small keys close to each other, called the Brothers, that have from 2 to 3 fathoms water close up to them. St. Domingo Key lies S. ½ E. of Ragged Island, distant 9 leagues, to leeward of which there is plenty of water; but no vessel should attempt to edge the bank to windward of it, until close under the lee of Key Verde, as there are many dangerous ledges and rocks betwixt them, on the edge of the straits, on which many vessels have been lost. *Ragged Islands.*

TIDES.—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 her setting. *Tides.*

They have frequently, during the above months, been observed 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, should, if possible, 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, 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 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 2 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 last 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 va-

riable 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, for 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 highlands 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. 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.

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. Stretch 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 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 Haneagua so as to allow sufficient time for entering the Crooked Island Passage before dark, or in the evening, so as to arrive there by daylight in the morning. The latter is generally preferred. The course from Great Heneagua to Castle Island is N.W. by N.

Having entered between Castle Island and the Mira-por-vos, the course to Long Key is N. by W. ¾ W., 7 or 8 leagues. Towards the Northern end of Long Key is a rise of land, with a flagstaff 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 2 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, 8½ 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° 50′, long. 74° 23′.

When you get abreast of this Key, you may with safety haul up N.E., if the wind permits, to go clear of Watling's Island. It is very dangerous to approach Watling'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. In going to the Northward you can seldom clear Watling'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.

The Hogsties.

THE HOGSTIES are three low keys, encompassed to the Eastward by a reef of 5 miles in extent. The South Key is in lat. 21° 40′ 30″ N., long. 73° 50′ W. They lie at the distance of 11 leagues N. by W. ¾ 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 round; 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, or Inagua.

GREAT HENEAGUA, OR INAGUA.—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. As 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.

On the night of March 17, 1842, the steamer Clarion, Capt. B. Williams, drawing 10½ feet water, struck on this shoal and knocked off part of her false keel.

Capt. W. supposes it to be about S.W., 15 miles distant, from the S.W. point of Heneagua; it being night, he could not see the land.

M. Chastonet 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 shows itself, although there are 2 or 3 fathoms over it. Without the reef, is white sand, to the distance of 3 cables' length, and on this is the anchorage, in 7 or 8 fathoms. Further 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.

THE GREAT BAY is sheltered from the North by the N.W. point, and from the South by the West point. This bay is 2½ 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 15½ 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 4 or 5 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. About a mile from the S.E. point is a small islet, and around it the bottom appears white; upon this you may anchor at about musket shot from the island. The white bottom continues along the South part, with here and there some reefs with breakers.

Statira Shoal.

STATIRA SHOAL, on which H. M. ship Statira was lost, bears South, nearly 3½ miles, from the South-east point of Inagua.

Little Heneagua.

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 1½ mile. 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.

CUIDADO REEF.—This, on the authority of Com. R. Owen, we believe does not exist.

Mayaguana, or Mariguana.

MAYAGUANA, or MARIGUANA, 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 part 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 sheltered by Mayaguana on one side, and the reef on the other.

Captain McGowen was lately cast away on Mayaguana Reef. He says it lies a mile and three-quarters further 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.

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., by the island and reefs, which run a long league to the N.W., 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 small hillocks; then the coast trends E.S.E. full 5 leagues to the East point, which we have already described. Mayaguana and Caycos Islands form the Caycos Passage.

The French or Plana Keys.

THE FRENCH or PLANA 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 appeared 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. We stood for the French Islands, and anchored in the white water on the West side of the largest, about 2 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 10 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 2 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—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.

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° 36′, or thereabout. They bear N. by E. from the Hogsties, about 19 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.

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 five principal islands, viz., the East Caycos, the Grand Cayco, the North Cayco, the North-west or Providence Cayco, and the Little or West Cayco: these form a semicircle 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 water. *Caycos.*

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 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 3 leagues, after which they decrease, trending Southward and Westward, 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., 5 leagues. The reef from the French Key stretches to the South 7½ 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 have no notice of the edge of the bank but the whiteness of the water.

From this sandy islet the bank sweeps a short league to the South, then to the S.E., 6 leagues, whence it trenches to the East, 5½ leagues, and N.N.W., 2½ 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 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 well 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 daylight; 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 the 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 4 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 1½ league of the shore.

A shoal called the Swimmer Bank is on the Western side, in lat. 21° 05′, long. 71° 31′. It is dangerous, and should not be approached without great caution.

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 à 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 further in, by towing or turning with caution; the entrance is not more than half a league or two miles from the shore.

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 white bottom.

Off the Caycos and Mayaguana Passage, 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 daylight; 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 François, 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 25 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 off Sandy Key, which lie to the North of 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 fear. Having run 10 or 12 leagues on this course, you will be out of the passage.

If, when you are 2 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 2 or 3 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. ¼ N. Having run 18 leagues, you will come in sight of the S.W. point of Mayaguana, which ought to be North of you, 2 leagues distant; you do not run any risk in approaching this point, which is safe. A small white shoal extends from it, with 3 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 a good 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 incloses them being pretty steep. On the N.W. of the large island, the reef running out some distance, it is necessary to give it a good berth. You may anchor 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 1,500 leagues. On this account, mariners from the cape should steer at once for the Little Cayco.

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, I would endeavor to get to the Eastward as fast as possible, taking every advantage of wind. In so doing, when advanced to Cape Nicolas, I would prefer 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. *Caycos Passage.*

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 daylight, with the distance off from it at taking your departure included; 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 keep 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 everything.

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 run 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 23° 06′. In going through either of these passages, there is a greater advantage gained, with less trouble, and sooner, than by Crooked Island Passage.

CAYCOS, *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 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. *Caycos.*

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.

The latitude of the S.W. point is 21° 36′, longitude 72° 30′; 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 will 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 Northwesterly 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 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.

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.

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 5½ miles. 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 further, 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 further to leeward; then it must bear S. by W. from you. *Canoe Cove.*

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. *Watering Bay and Pine's Key.*

At this anchorage you are sheltered from the N.E. to the S.S.W., passing by the E.

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 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 Captain Livingston:

"The whole of the North side of the Caycos is bounded by a reef, through which there are various openings, though 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 which I have seen. The Providence Caycos are 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, Cumbley, were all lost upon these reefs in 1816, within a few weeks of each other; and two days after the Aimwell was lost, another 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 daylight came, I perceived a brigantine completely embayed; and those on board 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, 5 leagues, and then S. by W. till daylight. 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.

EAST or COCKBURN HARBOR is in latitude 21° 29′ 33″ N., longitude 71° 31′ 06″ W. The harbor is one mile in depth, and the course is N.W., when the harbor is open. *East or Cockburn Harbor.*

High-water at 7 o'clock. Tide rises 3 feet. Depth of water about 14 feet. *High-water.*

TURK'S ISLAND LIGHT.—A white light, revolving every 27 seconds, with a dim light between the intervals, has been placed on the North point of the Grand Turk. *Turk's Island light.*

The tower, which is painted white, and 60 feet high, is situated 400 yards S. W. ½ W. of the extremity of the point in

Latitude.....21° 31′ 00″ N.
Longitude.....71° 7 40 W.

with the centre of the lamps 108 feet above the mean level of the sea.

The light is visible from all points of the horizon, except between the following bearings, when it is eclipsed by the Keys lying to the Southward of the Grand Turk.

Light eclipsed between			N. 21°	W.	*Magnetic.*	Variation 1° 45′ Easterly.
Do.	do.	do.	N. 16	W.	do.	
Do,	do.	do.	N. 8	W.	do.	
Do.	do.	do.	N. 8	E.	do.	
Do.	do.	do.	N. 13	E.	do.	
Do.	do.	do.	N. 21	E.	do.	

In clear weather, the dim light between the flashes can be seen distinctly at the distance of 7 miles.

With a clear atmosphere, the flash is visible, with eye elevated 10 feet, 15 naut. miles.
20 " 16
40 " 18
80 " 21

Caution to avoid danger off Cape Comete, East Caycos.—Vessels running for the Turk's Island Passage from the Northward must endeavor to make the light on a bearing to the Westward of South, as its range does not extend sufficiently far to guard against the dangers lying off Cape Comete, East Caycos.

Caution to avoid N.E. Reef, Grand Turk, Turk's Islands.—A reef runs off from the North point of Grand Turk, its extreme bears from the light N.E., distant 3 miles, and from thence extends Southerly and runs parallel with the East side of the Key, at the distance of 2 miles; consequently, vessels, on making the light between the bearings of S.W. and West, should (if intending to take the Turk's Island Passage) be careful to avoid this danger.

On the bearing of South the light may be safely approached to within 2 miles, and have the passage open.

This light cannot be seen from the dangers at the Southern entrance of Turk's Island Passage.

Turk's Island Passage. TURK'S ISLAND PASSAGE.—There are three principal islands, Grand Turk, Salt Key, and Sandy Key, which should always be made in going 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 further 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 further to the 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 3 fathoms.

To the South-westward of Sand Key, lies the Endymion Reef or Shoal, which is described below.

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 Island 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 2 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, by accident, has been prevented from sailing through the passage, may find a good shelter here, and wait for a 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 everywhere, 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.—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 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. North 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.

Endymion Shoal.

THE ENDYMION SHOAL has on it 4 feet water, and bears S.S.W. ½ W., 5½ miles, from Great Sand Key.

The Swimmer.

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 Sand Key is a white shoal, extending about 2½ miles from shore, on which may be found from 7 to 9 fathoms.

Salt Key, or the Little Turk.

SALT KEY, or the LITTLE TURK.—When you leave Sand Key, and steer for Salt Key, you must take 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 got 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 as soon as you have brought the reef to the Southward of you. It is 2 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 has 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 3 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.

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 2 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 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, except for boats, 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 4,200 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 North point of the Grand Turk is 21° 30′ N.

Square Handkerchief, or Mouchoir Quarre Shoal.

SQUARE HANDKERCHIEF, or MOUCHOIR QUARRE SHOAL.—This is a bank of 31 miles in extent, in an East and West direction; the Eastern end is 21 miles wide, running nearly North and South. On the N.E. point of the bank, in lat. 21° 06′ N., long. 70° 30 W., there is a shoal that breaks; and on the Northern edge of the bank there are two large shoals, each of 6 miles in extent. The S.W. end of the bank is in lat. 20° 56′, long. 71° W. The S.E. end is clean, having on it from 9 to 15 fathoms.

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 came in, ranging along the grounds.

Silver Key Bank.

SILVER KEY BANK.—This bank is of great extent; the N.W. point being in lat. 20° 54′, long. 69° 56′, running South-easterly 39 miles; thence South-westerly 26 miles; thence West, a little North, to lat. 20° 18′ N., long. 70° 02′ W. On the North-eastern edge of the bank there is a shoal of coral rocks a-wash, of 17 miles in extent, in a South-easterly direction, and of a triangular form. The Western edge of the bank, with the exception of the N.W. point, and a reef in lat. 20° 27′, long. 70° 0′, is clear.

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 nowhere 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 wind 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 Passages, after strong breezes from the N.E., particularly on the decrease of the moon. *Silver Key Passage.*

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 surveys of Capt. R. Owen, R.N., and published by E. and G. W. Blunt. *Bajo Navidad.*

In passing to the Northward of Porto Rico, a lookout should be kept for a rock or shoal (if not more thon 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."

General Directions for 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, making, 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 Caymans.

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 at Aguadilla, on the N.W. coast of Porto Rico, or at Gibara, in Cuba, but it is very uncertain. If approaching Baracoa, 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; it will, at all times, 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 sign 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 towards 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 upon; and an approach 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.

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 Maysi, on the East, to Cape San Antonio, on the West, is about 208 leagues; its breadth is unequal, being from 12 to 24 leagues.

Cape Maysi, the most Easterly point of the South part of Cuba, is situated in or near latitude 20° 15′ N. and longitude 74° 7′ 30″ 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 daylight, marked the highlands 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 Axules, 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.

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 water. 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. *Baracoa Harbor.*

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. *Port Maravi.*

From Maravi 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 a 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, only vessels drawing 10 or 12 feet water, or less, should go in; those will run no risk in running over the shoals, and therefore may enter this harbor by keeping in mid-channel; and when once past the entrance, they may steer to that part of the harbor which suits them best. *Taco.*

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 has a reef stretching to the N.W. of it; it is the Eastern point 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 2 cables' length. The islets are three in number: the Southern one is the largest; the anchorage for large vessels extends only until you are E. and W., true, with the South part of the middle islet, as further in there are only 12 to 18 feet of water. To enter 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 draw not more than 14 feet, you may run further 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 bearing of S.W., because the reef itself shows the opening. This harbor is never entered except in a case of necessity, as there is 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 from 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 Maysi, 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 enter 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 until you anchor to the Southward of the Eastern part of Cayo Moa, in 6½ or 7 fathoms, 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 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, for the mouth is formed merely by a break in the reef. To enter 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.

Cananova. 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 difficult to enter, or to get out of, and therefore unfit for large vessels.

Tanamo. 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 size. 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 further directions are needed.

Cabonico and Livisa. 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 Cabonica, 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. NIPE.—From these ports the coast continues foul, having a reef about W.N.W., 5 miles, to the harbor of Nipe. This bay 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 free; coming out is quite the reverse, for this requires the land breezes, which, as we have said before, are 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; 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, forms 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. 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, and 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 further to the Northward than any of the anterior coast, may be very suspicious, the marks already given may suffice; these being the mountains of Cristal and Pan of Sama. *Point Mulas.*

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 only fit for vessels 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. From this slope a sandy beach, named Gaurdalaboca, continues to the West: to the South of it may be seen a detached 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. *The port of 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 enter the harbor you must sail without the reef, until the windward point bears S. ½ E., when you may steer 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 1½ cable. You should run in mid-channel until you are past the two points of the entrance; and as 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. *Port Naranjo.*

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., 2¼ 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. Pilots for the Old Bahama Channel may sometimes be obtained here, but it is uncertain. *Gibara, or Xibera.*

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.

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 steer for 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 Malaguetta, 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.

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 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.

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 draught, it is necessary to go in at the break in the reef, (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. As 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 fear.

Nuevitas del Principe.

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 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; approaching, if you choose, within half a cable's length to 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 coast is lined with shoals, to keep clear of which requires good practice, which practice is equally necessary in the interior of the bay.

Point Maternillos light.

POINT MATERNILLOS LIGHT ('Colon') is situated on the Point, in lat. 21° 39′ 40″ N., long. 77° 10′ 55″ W. It is about 110 feet South of the Point. It is a revolving light of the first order, time of revolution one minute, height of the light above the sea 176 feet.

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, about 14 miles from Maternillos, there is a little mount called 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 small 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, are hillocks appearing like many islets, caused by the lower lands of the coasts 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. ½ W. from its Easternmost height; the first at the distance of 7, and the second at 12 miles Key Verde lies N.W. ½ 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. *Key Romano, &c.*

The Key Verde, or Green Key, lies 4¾ 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.

On Key Confites a light-house will probably be shortly erected. It is also proposed to erect one on the Northern part of Key Paredon Grande. *Lights.*

In order 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 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 anchor in 3½ or 4 fathoms, on sandy ground.

In getting under weigh 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, at the distance of 3 miles, there is, on the very edge of the grounds, a shoal, named Tributaria 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 the 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 1½ 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 port hand when going in, and passing within from half a cable to a cable's length from it. You anchor as soon as you are sheltered from the land of the Great Paredon, in the depth of water that suits the vessel's draught. On entering, you will leave to starboard another key, rather larger than the one you leave to port: it is called the Middle Paredon, and lies about 2¼ 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. Phillip's, Guilermos, and Santa Maria's. To the West of these, at the distance of 16 leagues from Coco Key, lies Key Francis. Key Francis may be known by a white flagstaff with a pale topmast, and a half barrel on the top, painted red, and two pilot-houses near. The flagstaff is on a low point of rocks at the West point. If the pilots are there they will hoist the Spanish flag near one of the houses, but will not come outside of the point. You may stand in, giving the point 3¼ miles berth, and if there is no pilot there, run in S. until a square white spot at the head of the bay bears E.N.E., and then run for it *Key Francis.*

until the flagstaff bears N. or N.N.W., and anchor in 3½ or 4 fathoms, good holding-ground. Do not anchor off the point, (the point bearing East,) there being 5 fathoms, and rocky bottom, and danger of losing anchors; or you may anchor, the point bearing N.E.; but run into 3½ or 4 fathoms, as outside of 4 fathoms it is rocky bottom. The land to the Westward of Key Francis trends to the S.E. and N.W.; to the Eastward of the key E. by N. and W. by S. The Armedinos Shoal bears N.W. ½ W. from Key Francis, about 10 miles, and always breaks, and is about 3 miles from the land. 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.

Sagua le Grande. SAGUA LE GRANDE.—This port has been recently opened, and a chart of it published. There are 9 feet water at the anchorage. There are three entrances; the Easternmost one is in long. 80°, and the Western one is in 80° 08′. An inspection of the chart is necessary to safe navigation.

The edge of the grounds from Key Francis, 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 the 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 upon 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, (Bella'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. Further to the West lies out another mountain, of proportional 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 Westernmost part of Key Cruz del Padre (Key of the Father's Cross). These mountains are the highest which are to the North coast of Cuba: but it is to be remarked that those which are on the East and West of them are little less elevated than these mountains. Such are the lands that are seen in the interior of the island, from the proximities of the Nicolao Shoal. A light-house is being erected on Cruz del Padre Key. It will be a revolving light.

Light.

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 YCACOS KEYS.—North-eastward from Port Ycacos, at the distance of about a mile from the edge of the bank, lie the three islands called by the Spaniards Cayo Mono.

Piedras and Monillo. 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 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.

Cardenas. Light-house. CARDENAS.—On Cayo Piedras or Stone Key, there is a light-house 96 feet high; it is a revolving light; time of revolution one minute; fifty seconds of light and ten of darkness.

Light. On Cayo Diana, which is about 4 miles S. of Cayo Piedras, there is a light 48 feet high; it is a fixed light, red and white.

Bring the light on Piedras or Stone Key to bear South, distant 5 miles, then steer S.E. ½ E. for a small round island, distant about 2 miles. When you are within a quarter of a mile of this island, you will perceive two islands to the Eastward, one

bearing S.S.E. and the other S. ½ E. Steer for the most Western extremity of the one bearing S.S.E., until within half a mile of it, and then take the middle channel between them.

There are two spar buoys on each side of this channel, painted white, with a strip of white bunting bent on to their tops. There is also a lookout station erected upon the island, on the port hand going in. It is a great clumsy log house, with a high platform upon it, and it is said a light is sometimes carried upon it; but this is doubtful. Upon the island, on the starboard side, is a large fishing-house, built of logs, with the gable end towards the water. When you have reached the centre of the channel, so that the spar buoys are upon either beam, steer S.W. ½ W., for the centre of the three hills, and the town of Cardenas will soon open on your port bow; and when it bears S.W. by S., haul up for it, and come to in from 9 to 11 feet water.

Pilots can always be obtained in pleasant weather, by making the proper signals. In heavy weather, however, they are unable to board you, their light skiffs being utterly unfit for a heavy sea. If you make the harbor in heavy weather, you will have to take your vessel in without a pilot. The channel is an intricate one, abounding in shoals and reefs which put out from the numerous islets that fill the harbor; but by observing the above directions, vessels of 10 feet draught and under will be brought in safely.

Joceno lies to the East of Cardenas, distant about 6 miles. It is nothing but a collection of warehouses for the storage of molasses and sugar, and has not depth of water sufficient even for the small schooners that ply along the coast.

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 make 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. *Matanzas.*

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 2 or 3 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 a 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.

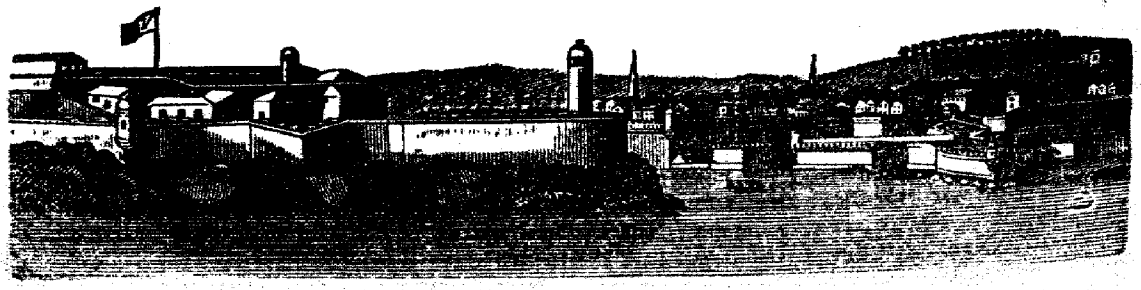
"The leading-mark is the South side, or notch in the pan, on with a large white house, standing on a hill at the back of the town, and is the Westernmost house visible, bearing W.S.W. ½ W., by compass. This mark will carry a vessel in mid-channel between the shoals; and when the castle of St. Severino bears from N.W. ¼ 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 further up, within one-third of a mile from the town, according to their draught 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 América Septentrional, 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 of 11 feet, extending 2 miles from the land, 19 miles from Point Guanos, 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, are a point which serves to recognize it by, and ascertain your situation.

Havana, 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 40 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 to Havana.

MORRO LIGHT is upon Morro Castle, and is 146 feet high; it is a fixed flashing ight, showing a bright flash every half minute. *Morro light.*

The entrance to Havana is between the Morro Castle and Fort Punta: here it is bout one-fourth of a mile wide, and the direction is S.E. by E.; the channel narrows o much, that, when you are one half of a mile from the Morro, it is only 600 feet ide. The best water is nearest to the Morro side.

In passing the first castle, (Morro,) you must not come to anchor, as a reef lies off he starboard hand as you enter, which is dangerous.

The harbor of Havana may be distinguished at a distance by the Paps of Managua, hich, as already stated, lie on the meridian of the entrance; while the land, both to he Eastward and Westward, is low and equal, with the exception only of the Morro, r little hill, surmounted by the fortifications and light-house. At 6 leagues to the astward, the hills of Jaruco, or iron hills, may be seen; these are of moderate eight, and detached. The tables of Mariel are about 6 leagues to the Westward; nd in advancing, not only these, but the hill of Cavanas may at times be seen. [The rm of the harbor can be best understood by reference to the particular plan of it, om the survey of Don Jose Del Rio, by whom the position of the Morro Castle has een determined and delineated on a chart, published by E. & G. W. BLUNT.] The ntrance in lies nearly S.E. by E. and N.W. by W., and is, therefore, very difficult hen the breeze is not to the Northward of E.N.E The breeze enters at about 10h. . M., and blows until sunset: and therefore it is only between these hours that you an sail into the port. It is very difficult, if not impossible, to sail in when the breeze s from E.N.E. to S.E., which it often is in the rainy season, and sometimes even in he dry season. Under such circumstances, the only resource is to anchor in the Morro Shoal, or Bank, and enter by towing or warping, when the breeze takes off, hich, as already stated, is at night. As, on entering, these difficulties are to be encuntered; so, on going out, you will not be quite free: for when the breeze comes to he N.E., which it often does in the dry season, or that of the Norths, it is not only nconvenient, from the wind's being scant, but also because a swell sets into the mouth f the harbor, which renders this operation much exposed to danger. Generally peaking, it is best to enter about mid-day, and to go out at the dawn of the day. hould the wind be scant for setting in, it is advisable to anchor outside the Morro, nd tow or warp in at night.

In approaching Havana from the Eastward, care should be taken to avoid a shoal pot, more than a quarter of a mile from the shore, the shoal of Morro Castle bearing bout N.N.E., 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 Morro Bank affords anchorage safe enough in the time of the ordinary winds nd land-breezes, but is much exposed in the season of the Norths, and in the hurriane months. It is, therefore, advisable to anchor so as to have the mouth of the arbor open, and to be extremely vigilant, lest you should be surprised. To direct ourself into the harbor, the eye may suffice, for in the channel there is no other anger than the shallows, which stretch out from each side. That on the Morro side oes not extend one-third of a cable from the shore. To avoid the leeward shoal, it s requisite not to go further from the Eastern shore than a cable's length; working our vessel so as to run along half a cable's length from the coast on the N.E. side, he mid-channel being at about three-quarters of a cable's length. When once abreast f the middle of Castle Blanca on the N.E., which will be when you are abreast of he N.E. or front side of the city, you may keep away, and anchor opposite to the astern 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, ith 5 fathoms over it. This bank is to be feared only when there is much swell on; nd at other times the largest ships may pass over it without touching. Even when e water begins to shoalen, you need not be afraid of it, as at half a cable's length om the Morro you will be perfectly clear. Finally, if you wish to pass in without ny risk, send a boat to place herself on the Capstan Shoal,* which will serve you r a mark; then steer so as to pass outside of her, and you will be free from all anger.

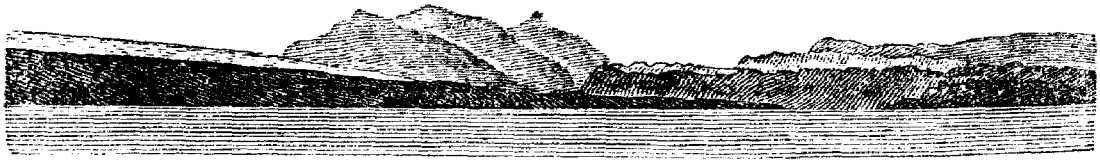
An English navigator, in giving directions for Havana, has said, "On going in, with e wind from the Eastward, keep as close to the Morro as possible. As soon as you

* The Capstan is the projecting edge of the shelf within the Morro at about a cable's length om the light-house. A similar projection further in, on the same side, is the Pastora or Shepdess.

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.

From the Morro, or Castle of Havana, to Punta de Ycacos, (or Yacos,) the distance is 20 leagues, and the course is 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.

SOUTH COAST.

We now commence with the South coast of Cuba from Cape Maysi, 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 Maysi to Cape Cruz, the N.E. coast from Cape Maysi 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 Maysi, 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 Maysi to Point Negra the shore ought not to be approached nearer than 2 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 Baitiqueri, 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: a British navigator remarks, "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 1½ mile, when the table-land of St. Nicholas' Mole will be in a line with the point. You may anchor in any water, the depth being from 35 to 7 fathoms, but 16 and 18 are the best; and plenty of fish may

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 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 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 has a reef, of which the windward one lies out a third of a cable, the channel is only 90 yards wide; it, however, 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 further 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.

GUANTANAMO, or CUMBERLAND HARBOR, a very extensive and excellent harbor, lies more than 24 leagues to the Westward of Cape Maysi, 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 Derretoro 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

* 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.

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 an officer on the Jamaica station, in 1809:

"The appearance of a remarkable spot of land on the side of a hill, at a distance inshore, 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., run in with that bearing until you open, on the Eastern side, a small sandy point, 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 before-mentioned 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 3 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 port 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 Barracos, 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 Barracos 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 Barracos.

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.

St. Jago de Cuba light. ST. JAGO DE CUBA LIGHT is a revolving light, 226 feet above the level of the sea; time of revolution 7′ 20″. Lat. 19° 48′, long. 75° 58′.

The Harbor of St. Jago de Cuba. The HARBOR of ST. JAGO DE CUBA is very good; but the entrance being narrow and crooked, is difficult. On the East point stands the Morro castle, and a little further 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, 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 it is a cable's length in width, and further 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 make this port you ought to sail half a league or 2 miles off the shore, until the Estrella castle bears N.E., when, steering in that direction, you will enter the channel formed by the reefs; but, as 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 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 how 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, de 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 approach it so near, it is 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 extends not less than 20 leagues in a N.N.W direction.

Santa Cruz. SANTA CRUZ.—The proper channel through the keys to Santa Cruz is the channel of Cuatro Reales. Steering up N. by W., by compass, from Cape Cruz, will reach a chain of keys stretching East and West, nearly, eleven in number. The entrance of the channel is between the two Westernmost keys, which are large, and distant from each other 6 miles, and is about 2 miles to the Westward of the Easternmost one, immediately to the Eastward of which is a small sandy key, unlike any other about here, which serves as an excellent mark for the channel. There is constantly one pilot, (perhaps more now,) on one of the keys near the sandy key, who stops there one month and then is relieved by another. The entrance of the channel bears from Cape Cruz N.W. by N. A knowledge of these facts will save much uneasiness; because, on referring to the chart, an unacquainted person would directly decide that the best channel was the one named the Este Channel on the charts. The marks to enter are as follows: it is bounded on the West side by the Eastern head of the Twelve-league keys, and on the East side by three keys, and a bank runs off from either side,

leaving the channel very narrow and nearly in the middle; bring three keys, which are inside, (and form a triangular figure,) to bear North-east by North, and then haul up North, when you will have a small round key directly ahead, for which you may steer until quite over the shoal water, and which makes an excellent mark to steer by. This will carry you over in about 3 fathoms. When the Eastern head of the Twelve-league keys bears N.N.W., and the flattest keys on the Eastern side of the channel, East by North, there will be the shoalest water, from which the course up is N.E. by N. ½ N., passing between the keys that form a triangle, leaving one on the port hand and two on the starboard; the depth of water between which will be from 10 to 13 fathoms. When the Eastern head bears W. by N., and the flattest key to the Eastward E. ½ S., the depth of water will be from 6 to 7 fathoms, and quite clear of the shoal water. It is high-water, full and change, at 12 o'clock; the water rises about 4 feet, but the tides are not regular about the keys, sometimes earlier and sometimes later, and appear to be very much influenced by the wind. Near to the main-land, in the first of the morning, the wind is more Northerly than in any other part of the day, and draws round gradually after the sun, frequently going so far as West. After the sun sets there is an interval of calm which is succeeded by the land wind.

High-water.

To coast along the Doce Leguas Keys, 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 end 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. points of its entrance are 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 3 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 nowhere less than 14 fathoms, on sand and shells.

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 daylight, 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 3¼ 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 port, 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 2 miles off Cape Cruz, can be passed within 50 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, lies 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. *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.

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 lookout, 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 the Puga, which reef always shows; and in the passage you will always have 6 fathoms 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 these keys, he may run in until he recognizes the key called Rabi-horcado, which he will leave on the port 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 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 draught 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 2 leagues, forms a bay with 2½ 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 3 miles, follows Point Manati, on which there are some wells of tolerable sweet water. Point Manati, with Point Tolete, which lies 2 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, 4½ 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 3½ 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 Caycos de Tierra, (Keys of the Land,) which, with Point Yguanojo, form a bay called St. Pedros, having from 3½ to 6 fathoms, on clay.

The Caycos 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 Machos 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. ¾ 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 further 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 lies 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 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. *Tides.*

MASIO.—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 Guard-house 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. *Masio*

Passing in for Masio, you leave the Bay of Caballones 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 midstrait, and with the prow N.E. by E., anchor when you are in 3½ fathoms, clay or ooze.

CASILDA, TRINIDAD DE CUBA.—When up with Cape Cruz, say it bears N.E., distant 3 miles or so, steer (if you have daylight enough to run it, say 60 miles) N.W. by W. 55 miles, and you will be up with the Eastern heads or keys of the Twelve-league Range. If night is coming on steer N.W. by W., 30 miles, or less, which will run you off the bank of white water: then steer W.N.W. until daylight, and then haul your ship to the Northward, and make the keys if they are not in sight, and coast along them at 3 or 4 miles distance, bearing in mind that Key Breton has a reef running out some 2 or 3 miles S.W., and very dangerous. This coast along these keys is not clear, and too near a proximity is very dangerous, as strong sets of current are felt here, setting on and off, as the tide may be. When you have doubled Cape Breton, your course to Zarza Fuera Key will be N.N.W. ½ W., distant about 6½ leagues. By steering this course you will leave Key Zarza about 5 miles on your starboard hand, and when it is abeam, you steer a half point more Westerly, (or say N.W. by N.,) until you raise Key Blanco, which will be nearly ahead, and you will not mistake it, as its base is covered with white sand, (from which it derives its name.) You will in this course have some keys on your *starboard hand*, called the Machos. When up with Key Zarza, if night is coming on and you have not daylight enough to reach Key Blanco, you can bring your ship to anchor by running on the bank, giving the N.W. end of Key Zarza a berth of about a mile, and keeping the lead going until you get 7, 6, 5, or 4 fathoms water, sandy bottom. There is good anchorage anywhere on the bank between Zarza and the Machos Keys, taking care not to approach too near the Machos in the night, say 2 miles or more distant, as its vicinity is bordered with reefs, all danger of which is plainly visible by daylight. Also observe there is a strong set of tide on the bank here and its vicinity, setting E.N.E. and W.S.W. From Zarza Key to the Machos the bearing by compass is N.W. by W. ¼ W., not in sight from each other. *Casilda, Trinidad de Cuba.*

The vicinity of the Machos is dangerous to approach in the night—by daylight all danger is plainly visible. They are connected by reefs extending to the *Purga* Keys, which are low drowned keys or rocky heads, on which the sea continually swashes, and lie nearly West from the Machos. There is also a reef runs out about East from the Machos, from 1 to 2 miles. The entrance on the bank between the Machos and Key Blanco is not clear, as it is from Zarza to within 2 miles or less of the Machos. Key Blanco bears W. by N. (by compass) from the Machos. Nearly on a line, say about half way or a little more of the distance from the Machos to Key Blanco, is a dangerous reef, nearly drowned, a little above the water's edge, and extending to within about one mile of Key Blanco. Between said reef and Key Blanco is a good entrance on the bank, as also between the Machos and said reef. You are now up with Key Blanco, where you will get or *ought* to get a pilot, as it is the pilots' station by law, but they are very negligent, as their pay is arbitrary whether services are rendered or not.

Here you may wish to anchor, from many causes, viz., no pilot on board, night coming on, weather bad, and the danger of drifting about in such near proximity to so many shoals, &c. Follow these directions, and you may safely come to anchor, viz.: Having Key Blanco in sight, steer for it till you have it well aboard, say 2 cables' length or less, you may then leave it on your port hand, and steer N.E. or N.E. by E. until it bears West, then let go your anchor in 3 or 4 fathoms water. There is a spit makes out from Key Blanco about N.E., say one cable's length, which you will avoid in your N.E. course, and the reef on your starboard hand. This is the entrance to the deep-water channel, say 16 feet. With the wind to the Eastward or off the land, you will, when well up with Key Blanco, steer for it till within one cable's length, leaving it on your starboard hand, giving the West Spit a berth, haul around it, luff up, and let go your anchor in 3 fathoms water. This is the common entrance to the port with vessels not drawing over 13 feet, viz., when you have Key Blanco well aboard, then steer (if not wishing to come to anchor under Key Blanco, as above directed, to wait for a pilot) N.W. by W., which course will bring you into a ridge of white water or shoal looking bank, and inside of a reef on your port hand; and if you do not draw over 11 or 12 feet water, choose the narrowest part of the white ridge to cross over; you will also see on this course some 2 stakes with tufts of Palmetto leaves tied to their tops—you may leave them on your port hand—you will then, on your course N.W. by N. or N.W. ½ N., raise more stakes, which leave on your starboard hand, as also all the others as you proceed down. The stakes denote the best water, you will therefore keep near to them. If you draw over 12 feet water, you had better come to anchor as directed, under the West side of Key Blanco, and wait a pilot.

A good mark is now to place your ship's head on for the South end of the town of Trinidad, which will bring you along the range of stakes, and will leave them on the starboard hand until you open the shipping in the harbor. Then steer for the fort on the point, or for the shipping; your eye will now be your guide; only avoiding the white shoal or spit running out from the fort, and leaving Rat Island or key on your starboard hand. Enter the harbor, choose your position, and let go your anchor.

NOTE.—If you should fall to leeward of Key Blanco, bring the town of Trinidad (in the hill side) and the fort on the point or entrance to the harbor in one, until you see a large red building or house on the East end of the town, then place the fort and this house in one, you will be then on a line with the West end of the reef: you can now bring said red house on with the Lookout House on the top of the hill back of or above Trinidad, or steer North till you see some stakes inside the reef, or which are a part of the before-described stakes, run for them, or steer N.E. till the fort bears N.W., and if no pilot, and you are a stranger, come to anchor. You are now inside the reef which extends from Key Blanco nearly down to the fort, and which has some 2 or 3 openings for light vessels. In laying off and on, off the last-mentioned channel, do not stand inshore with the fort bearing to the East of N.N.E., as there is a dangerous reef in shore, Westward of the fort, called the Mulattos.

NOTE 2d.—The weather channels are always to be preferred, and the leeward ones to be avoided, except in extreme cases, &c.

From the River Guanrabo 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. ¾ N., as far as the West point of the River Honda; from this it continues N.W. by W. ¾ W., 9 miles, to the point of San Juan, which is well marked, as the coast afterwards trends N. by W. ¼ W. for a long mile, to the River Guagimico.

Between the River Guanbaro and the Point of San Juan, the Rivers Guanyara, Cabagan, Honda, Yaguanabo, and San 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 small reef, which stretches out between the River Yaguanabo and San Juan, and which does not extend from the coast so much as 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 Aramao, are met with; but they are of little importance.

Cienfuegos light.

CIENFUEGOS LIGHT is a flashing light, 82 feet high, with "Villa Nueva" painted on the tower. It is on Point Colorados, and is in lat. 22° 2′ N., long. 80° 28′ W.

NOTE.—The longitudes of the keys and the coast adjacent of the South side of Cuba between Cape Cruz and the S.E. point of the Jardinillos, are from 10 to 14 miles too far to the Westward on the charts.

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. ¼ 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, steer towards the S.E. point of Cayo de Carenas, 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 town of Fernandina, or Cienfuegos, is in the harbor of Xagua. You can carry in 18 feet water, and it is the third town in importance on the South side of the island. Rise of tide 2 feet. *Tide.*

The coast West of Xagua, or Jagua, is all of soboruco rock, and without any bank or shoal, for nearly 21½ miles, to the point of Caleta Buena, (Good Cove;) it thence trends W.N.W. ¼ W., 6¾ miles, to the East point of Cochinos, or Swine's Bay.

There is a shoal S. by W., true, 30 miles from Cienfuegos; it is nearly circular, the least water on it being 10 feet on the N.E. part. It is coral in formation, and is rising gradually. It is called Placer de Jagua. *Cienfuegos Shoal.*

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 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 there is having generally a bottom of sharp rocks. *Cochinos Bay.*

Point Padre is very low, with a sandy beach. S.E. from it, at the distance of 6¾ 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 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 Lavendera (Washerwoman) Rocks, which lie about 4 leagues W. ¼ 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 2 miles East and West. The West point of it lies West 15¾ miles from Point Padre, and with another key which lies to the N.W., forms the Bouqueron (Little Mouth) of Calvario, which has little depth.

The Bouqueron 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 in the Eastern part of the Jardinelloa, and is steep to. Between the same point of Diego Perez and the commencement of the reef, there is a passage on 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 Jardine's Bank.

From Palanca Key, which lies 12½ 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 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 extend 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; not, however, in any of the channels, for vessels which draw more than 10 feet.

N.W., at the distance of 3½ 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., 15½ 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 call 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, 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. ¼ S. to the anchorage of Batavano, which is 8½ 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 2½ 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. ¼ 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 Felipe, (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 to October, (hurricane months,) which are much to be feared on all this coast.

Light. At Batavano is a fixed light, 31 feet above the sea. It is a lantern hoisted upon a mast.

To the Southward of Cruz Key, at the distance of 2 leagues, lies Monte Rey Key; and between is a channel with 2½ 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. ¾ N., forming a regular bay, called Ensenada de Majana, which terminates to the South, at Point Salinas, $10\frac{3}{10}$ 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. ¼ W., $12\frac{6}{10}$ miles, from Salinas Point, a small point stretches outward. At a short distance to the North of it is the Creek of Savana-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, clay, except a spit with 1½ and 2 fathoms, which stretches out from the Southernmost key about 2 leagues, to the S.W. ¼ W. of the Guanima Keys. The extremity of the spit lies S. ¾ E., 5½ miles from Salinas Point.

The Guanima Keys are included in the group which, to the Westward, forms the Channel of La Hacha, and are situated to the Southward of the River of Guanima and of Point Cayamas.

S. ¾ 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 2 leagues, after which, following S. and S.W., it terminates at Fisga Point, forming the Bay of Ayaniguas; this point lies S.W. ¼ S., distant 10½ miles from the former.

About S. ¾ E., 10½ 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 2 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 2½ 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 2 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 3 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 small 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 small 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 2 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 2 cables' length.

From Llana Point the coast trends W.S.W. ¼ 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.

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 further 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 from 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, 5½ 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 2 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.

Cape Antonio light. CAPE ANTONIO LIGHT is a revolving light, 108 feet above the sea; time of revolution one minute.

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. ¼ N., true, dist. 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 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 Biscayne, 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 2 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, extending 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, thence West for 4 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 of 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 reach further 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 2 fathoms water, lies South, 9 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. *Jack Taylor's Reef.*

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 Çantiles; 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 7 miles, to another small point, which, with the former point, are the boundaries of the piece of coast denominated Playa Larga (or Long Beach.) *The Isle of Pines.*

From the Western point of Playa Larga the coast continues W. and W. 5° N., true, for 8 leagues, to Cocodrillo, (or Crocodile 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 is found the anchorage and watering-place of Puerto Frances. This small roadstead, the bank of which extends about half a mile, with a depth of 5 fathoms, 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.W. quarters.

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 5 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. ¾ W., for 10 miles, to a small point which forms, to the West. the mouth of the Rio de los Indios, (Indian River,) whence the coast continues N.W. 7 4/10 miles, to Buenavista Point, which is the Northernmost point of the Bay of Siguanea, and is 10 4/10 miles N.N.E. from Key Frances. Siguanea Bay extends 17½ miles N.W. and S.E., and has from 2½ to 4½ fathoms water, grassy bottom; but the passage between Key Frances and the Southernmost of the Indian Keys has not more than 3½ fathoms, sandy and grassy bottom.

The Indian Keys, separated by small channels, extend themselves to the N.W. by W., 8 miles, from the Southernmost of them. The Southern extremity lies N. ½ W. from the point of Key Frances, 9½ miles distant, and 4 6/10 miles W. ¾ S. from Buenavista Point; in the channel between them and the latter, there are from 4 to 5 fathoms water, clay 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. ¼ E., to a short distance, and afterwards E.N.E., true, to the Northernmost part of the island, which lies 3¾ miles distant from Barcos Point. From the Northernmost point the coast continues E. ½ N., 5½ miles, to a small 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., 4½ miles, to Salinas Point, and thence continues S.E. by E., 7 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 disembogue 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 2 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 2 miles distance, in 3 and 3½ fathoms water, on a clay and grassy bottom; but a passage further 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.

INDIAN KEYS, &c.—From Key Frances the edge of the deep water follows nearly N.W., 11½ 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 San 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 Francis 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 Easternmost of the San 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 Rosari, 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 Redonda Key Passage, which has 2½ fathoms, on clay.

Remarks on Cape Antonio, the S.W. of Cuba, and the Isle of Pines.

At about 2 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 2 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.

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 has been said will enable any person who looks carefully to find them, though you 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 2 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 inshore, 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.

Jardines.

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, while in the Caycos de San Felippe, 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 flagstaff 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 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 draught, 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."

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.

High-water. It is high-water at Cape Antonio, on the full and change, about 9h. 33m., and the vertical rise is 18 inches. The flood sets to the Southward, (the flood, therefore, bends with a Southerly current; and thus it appears to continue Eastward, within the Isle of Pines, &c.) and the ebb Northward. The velocity is about three-quarters of a mile 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 edge of the bank is clean all along, and steep to.

In proceeding from Cape Antonio to the Northward, there is a bank of 10 and 15 fathoms, and which is 12 miles N.N.W. ½ W. from the 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.

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° 07′ N., and 84° 47′ 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 a 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 topmast 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 rattlings up; but the three aforesaid hummocks we raised upon deck, when we were about 10 or 11 leagues off our aforesaid station of 5 leagues to the Westward of Cape Antonio."

The highlands of Cuba are in many places particularly marked. The principal lands thus remarkable, in a regular succession from West to East, have been enumerated as follows: the Highlands 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. Those noticed in the Derretero, 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 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. 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 23°, longitude 83° 15′. 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 its interior points, are bordered with a reef and edge of shallow

* Mr. Finlaison says, "With the Coxcomb Mountain bearing S. ½ E., you will be in long. 84° W."

† Probably the highlands of Buenavista; for the charts of this port are yet inaccurate and contradictory.

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 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 Larga, 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 steer to the S.W., and when you have arrived on a line between it and Point Difuntos, you may anchor in 7 fathoms, clay; or, if more convenient, you may luff up to the South-eastward of Point Difuntos, and 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.

Bahia Bank.

THE BAHIA BANK does not exist.

Puerto de Cavanas.

PUERTO 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 Derretero says, you may run along the coast between Bahia Honda and this place, at the distance of 2 miles. Puerto 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 the same distance, Northward from the Eastern point of Larga Island.

Puerto del Mariel.

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 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 West of Mariel the coast is likewise low, for a long league, until it rises and forms the Hill of Cavanas. Further to the West

* 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. † Wood Island of the Old English Charts.

‡ Long Point of the old charts.

may be distinguished other highlands 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, steer towards a small rocky key, off the leeward point; and as soon as you are within two-thirds of a cable from it, steer S. ¾ E., 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, 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.

The Mona Passage.

THE MONA PASSAGE.—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.

The winds are generally light in this passage, and but little current. The Island of Zacheo, bearing W. by N. ½ N., 11 miles, from Aguadilla Bay, may be seen on a clear day from any part of it. It is high and very bold. 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.

Desecho or Zacheo.

DESECHO, or ZACHEO.—This little island, nearly covered with trees, stands like a beacon in the ocean, at the distance of 11½ miles W. ¼ 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.

Report of the Master of the U. S. Ship Macedonian, for the month of April, 1845.—In the Mona Passage met with a current of 1½ knot, setting nearly North; about lat. 28° N., long. 71° W., a current of 1¼ mile, running W. 23d instant, lat. 35° 45′ N., long. 72° W., entered the Gulf Stream; left it in lat. 37° 32′ N., long. 72° 08′ W. I found the direction of this current to be about N.E. by N., 2 knots per hour: the highest temperature of which was 77°, the mean 76°, being 15° warmer than the water immediately bordering it.

Mona and Monito.

MONA AND MONITO.—These isles lie nearly in the middle of the Mona Passage towards the South.

Mona Island.

MONA ISLAND.—This island is nearly level, and of moderate height. We could not see it further 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 2 miles, we ran along these sides, but saw no other danger than a reef which extends 1½ mile 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.

There is anchorage here 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 came 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 3 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.

HAYTI, OR SAINT DOMINGO.

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.

Hayti, or Saint Domingo, from Punta Espada to Petit Trou.

PUNTA ESPADA is too remarkable in its outlines to be mistaken. It lies about 10 miles from the East point of the island of Saona. Punta Engaño, the true East point of the island of Hayti, is a low point stretching sharply to the Eastward. *Punta Espada.*

PUNTA CANA.—The first anchoring-place to the South of Cape Engaño, is Punta Cana, in lat. 18° 30′ N., and long. 68° 23′ W. The shore is skirted by a reef, which obliges the vessels that have to take in cargo at this place to lie according to size from one to one and a half sea-miles from the shore. The reef affords passages for the boats to take off the cargo from the beach, which is sandy. *Punta Cana.*

The tides are not always of equal strength, running sometimes 6 hours to the S.S.W. and 6 hours to the N.E.; at other periods the ebb-tides are stronger than the flood-tides, and if such a case occurs, the North-easterly tide runs even with greater velocity than the South-westerly. *Tides.*

Vessels (excepting small sloops that draw no more than 6 feet) are obliged to come to an anchor outside of the reef. A vessel of from 300 to 400 tons, would not be safe closer than a mile and a half from the land. There are two breaks in the reef, which are used for taking the wood from the shore on board. They have 6 and 6½ feet water; it is, however, requisite to use caution with the launch, as the passages are narrow, and much impeded inside by heads of coral rocks. The swell or ground-sea is sometimes very severe along this coast, and a stiff Northerly wind renders all communication with the shore impossible. The months from May to October are the best qualified for loading here. The breeze is generally at that time to the South of East, and calms prevail more than at any other period.

PUNTANAL and GUAYACANES.—These loading-places are a few leagues further towards Punta Espada, and the remarks made with regard to Punta Cana apply equally to Puntanal and Guayacanes. There are some ranchos or huts on the beach, inhabited by the laborers of the adjacent mahogany cuts. Puntanal is about 3 sea-miles South of Punta Cana. *Puntanal and Guayacanes.*

BOCA YUMA, or HIGUEY.—The anchorage is good but exposed to the breezes. You anchor off the small sandy beach called Playeta, near the windward point of the river, in 12 fathoms water. A bar, which affords only from 8½ to 9 feet water, prevents large vessels from entering the river. Within the bar there are 12 feet water. The anchorage is well protected, but small in extent. Fresh water may be procured by ascending the river to the Derumbadero. This can only be done in a small boat. *Boca Yuma, or Higuey.*

CABO FALSO.—The anchorage between Cabo Falso and Punta Yuma is good; vessels may lie close in, in from 9 to 12 fathoms. The ship is, however, exposed to the North-easterly winds. It must likewise be observed, that the tides run with great velocity, chiefly near Punta Cuevita, where it races with a velocity of from 4 to 5 knots. *Cabo Falso.*

Punto Yuma lies in lat. 18° 22′ 46″ N., and long. 68° 35′ 36″ W. From this determination I have deduced the position of Cabo Falso as in lat. 18° 20′ 10″ N., and long. 68° 35′ 24″ W.

The land of Cabo Falso rises in mural precipices of coraline limestone from 150 to 220 feet. The false cape is the projecting Southern point of this elevation, and presents, as seen from the North, the profile of a grotesque head.

GRANCHORA.—This loading-place ought never to be included in a charter-party. It is situated about 3 miles to the S.W. of Cabo Falso. The vessel cannot approach within several miles, and has to anchor to the lee of Catalinita, or to the lee of the reef that stretches from Granchora towards that islet. Such a heavy sea prevails usually along the shore, that weeks may elapse before the launch can take off a load. *Granchora.*

PUNTA MARTEL.—The same remarks refer to Punta Martel. *Punta Martel.*

SAONA.—This small island extends from its Eastern point about 16 miles N. 70° W. It has a projecting Southern point, and is at its widest part from South to North about 5 miles across. Between it and the main lies the islet of Catalinita, bearing from the rocky North-eastern point of Saona N. 50° W., distant 5½ miles. A large horse-shoe reef extends from Catalinita towards Saona, affording, however, between the North coast of the latter, and the South-eastern extent of the reef, a fine channel, with *Saona.*

6 fathoms water. When the reef has been cleared, the vessel ought to keep North-westerly, to avoid a shallow that runs from Saona, and anchor in 5 fathoms water, Catalinita bearing N. by E.

Small vessels may pass through the channel between Saona and the main coast of Saint Domingo; at its Eastern outlet, however, are mud-banks, with only 7 feet water over them.

Catalinita. CATALINITA.—When keeping for the anchorage of Catalinita, you may make bold with the Northern shore of Saona until the Horse-shoe is cleared. The anchorage is well protected, and the bottom clear and sandy. The currents sweep with great force towards the N.W.

The North-eastern point of Saona is bold, consisting of high cliffs; but its South-eastern point is low; and there is a reef to the South-eastward which breaks near the shore, and extends nearly 3 miles, with only 4 and 5 fathoms over it. The reef keeps this depth until within a mile of the low South-eastern point of Saona. Large vessels coming from the East, ought not to approach the shore within 4 miles, until the extreme Southern point is cleared.

There is a good anchorage about 3 miles to the West of the South-eastern point, in front of a sandy beach, called Bahia Cabello; but at about 1¾ to 2 miles to the South of the bay, where the sandy beach ends and the shore becomes rocky, lies a dangerous shoal.* The shallowest part has only 6 feet, with the water breaking upon it during a heavy sea. A quarter of a mile to the N.N.W. of it, is another dangerous shoal, with from 9 feet to 3 fathoms water. There is a good pass between it and the Eastern shoal. Vessels frequent occasionally Bahia Cabello for the sake of fire-wood and fresh water.

The opening or Western entrance to the channel of Catalinita, between Saona and the main coast, is called Boca del Catujano. As already observed, it has only 7 feet water at its shallowest part, being narrowed in by mud-banks and coral rocks.

It ought likewise to be noted, that a reef stretches from the Western point of Saona towards the main shore, which must be guarded against should a vessel on beating up keep the shore. The late Captain Lawrence, of H. M.'s surveying vessel Scorpion, determined the position of the sandy beach (Cascon) a little to the South of the two Western points, as in latitude 18° 10′ 18″ N., and long. 68° 46′ 53″ W., the latter relative to St. Thomas, taken as in long. 64° 55′ 40.5″ W.

Boca de Quiabon. BOCA DE QUIABON.—This is an open roadstead with good anchoring-ground. Large vessels anchor in from 8 to 9 fathoms water; the mark for the anchorage is, to keep the point Las Minas in one with Point Aguila, that forms the Eastern point of La Romana, and to bring the two cocoa-nut trees on the shore, in front of the largest house in the small village, to bear North. The bottom shallows very gradually, and at the distance of 3 cables' length from the shore, there is still a depth of 3 fathoms. The ground to the windward of the mark just given is rocky, and there is likewise said to be a shoal with only 13 feet water on it.

The mouth of the River Quiabon is impeded by a bar, which affords only from 2½ to 3 feet water; and that small depth is sometimes reduced to half a foot during dry weather, while freshes, on the other hand, deepen and widen the entrance. The mouth of the river is sometimes entirely blocked up by sand-banks. Formerly, vessels that drew 12 feet could go up the river as far as the Malena, at that period a well-cultivated estate, for the purpose of loading wood or produce. The river is now much impeded; boats nevertheless manage to ascend the Quiabon to the small village Gato, which may be called the port of the town of Higuey. It lies on the left bank, and is, following the course of the river, 5 miles from the mouth.

The village of Quiabon consists merely of a number of buhios or small huts, built of wood and covered with palm-leaves. It suffers from want of fresh water. At present the inhabitants either use brackish water, or they send up the river. The tides rise seldom more than 22 inches or 2 feet, hence the sea does not extend far up the river. The weather point or Punta Barlovento is in lat. 18° 24′ 20″ N., and long. 68° 54′ 23″ W.

Bayahibe. BAYAHIBE.—Two miles and a half E.S.E. from Punta Barlovento, near Quiabon, lies Bayahibe, where recently vessels have commenced to load wood. It is considered a better anchorage than Quiabon. The sea is smoother, as Saona and the projecting point of Las Palmillas protect the anchorage. Vessels lie in from 6 to 7 fathoms, distant about one mile from the shore, sandy bottom.

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* I have already drawn attention to the strong currents to the South of Porto Rico and Saint Domingo. The master of the bark Alert considered himself, on the 15th of August, 1850, at 6h. P. M., about 35 miles to the S.S.E. of the East end of Saona. Shortly after 10 o'clock that evening, the vessel struck on the above shoal.

GUARAGUAO and LAS PALMILLAS.—S.E. ½ E., nearly 8 miles from the Punta Barlovento, near Quiabon, lies the anchoring-place of Guaraguao; and some miles further to the East, is Point Las Palmillas, from whence to the North-western shore of Saona it is only 3 miles. The reefs that extend from the North-western point of Saona, have already been mentioned, and may prove dangerous to a vessel that has to proceed from Las Palmillas to a port or anchorage to the East of it. Guaraguao and Las Palmillas are seldom included in a charter-party. *Guaraguao and Las Palmillas.*

LAS MINAS and BURGADO.—About half a mile to the West of the anchorage at Quiabon, is the loading-place of Las Minas; and somewhat further downwards, El Burgado. Las Minas is a sheltered place for small vessels; but those of larger burden must lie in 20 fathoms, and masters frequently prefer to remain with their vessel at the anchorage of Quiabon, and to send the launch for the wood to Las Minas and Burgado. *Las Minas and Burgado*

CALETON.—This loading-place, to the East of Punta Aguila, offers scarcely a good anchorage. The tides sweep with great strength, and render it laborious, when wind and tides are contrary, to reach the ship at anchor. *Caleton.*

BOCA DE LA ROMANA.—The River Romana affords within a short distance from its mouth one of the best sheltered ports on the South coast of the island. The entrance is narrow, (it being not quite a cable's length from point to point,) and 34 fathoms from the lee point there is a small shoal, with only 3½ to 4 feet water on its shallowest part. *Boca de la Romana.*

On entering the river, which must be with a leading breeze, and having reduced your soundings to 9 or 10 fathoms, keep the two *inner* points of the river (the first or Western of which is then about 600 fathoms, the second or Eastern 800 fathoms distant, bearing N. 17½° W.) about 1½ degree open of each other; the two inner points being *in one* is a mark for the shoal. Continue that course until you are abreast of the weather point, remembering that there is a reef a little to the East of that point. Having entered the river, you will observe two rocks, from 6 to 10 feet above water, on your starboard. Keep the lee bank a little closer than the weather bank, and proceed up the river until you near the inner lee-point. Keeping now the Northern rock you noticed on entering the river on your starboard, looking over your stern in one with the weather point at the mouth, come to anchor in 5 fathoms. You will then notice two rocks a little South of the inner lee-point, around one of which you may make fast,* and if you do not wish the vessel to swing to the tides, do the same round a rock on the Eastern bank. Small vessels anchor round the inner lee-point in 10 or 11 feet water. A short distance to the North of this anchorage is a shallow with only 6 feet water.

I need scarcely observe, the river being so narrow, and not permitting any room for working a ship, the vessel ought to take her departure only with a land breeze sufficiently strong to give her headway. The two dangers against which she has to guard, are the sunken rock off the lee point, and the weather reef. The River Romana has broken through the hills of coralline limestone; they frequently approach the shore in perpendicular walls. Small sailing-vessels may ascend for nearly 2 miles from the mouth, but they require a pilot. Boats frequently get as high up as the Derumbaderos, and even to the rapid, for fresh water. There are no difficulties for boats until coming to the little island, where a shelf of rocks shallows the river to 2½ feet during its mean stand, and to only one foot on approaching the rapid. The river falls here over a shelf of rocks, so that the boat may almost lie under it and permit the water to run into the casks.

The small village La Romana lies on the hills above the river on its right or Western bank; the ascent is steep, and very incommodious. The commandant has his residence on the left bank, opposite the village. The position of this place was, according to my observations, in lat. 18° 27′ 32″ N., and long. 68° 58′ 37″ W.;† from which determination I have deduced the position of the left or weather point of the mouth of the river La Romana, as in lat. 18° 25′ 10″ N., and long. 68° 58′ 20″ W., but as the distance from any point of observation to the mouth of the river has not been trigonometrically ascertained, this determination may deviate somewhat from the truth.

SANTA CATALINA.—The island of Santa Catalina, or merely Catalina, lies about 2 miles off the Southern coast, between the mouths of the rivers Cumayasa and La Romana. The channel between the main of the principal island and the islet extends East and West, and affords a passage to the largest vessel by keeping the main-land close on board. There is a good anchorage in 3½ fathoms on the North- *Santa Catalina.*

* I have given to these rocks the name of the Mooring Rocks.
† The Aneroid gave for the height of the place above the river 180 feet.

western part of Catalina, near a bay where the vessel is protected by the two jutting points of the island. The North-western point has a reef, on which the water breaks to warn against the danger.

Boca de Cumaysa. BOCA DE CUMAYSA.—I have not examined the mouth of this river, which it is well known affords as good an anchorage as La Romana, with the preference that the entrance is not endangered by a shoal. Mr. Lundstrom, master of the Swedish bark *Jenny Lind*, has communicated to me the sketch of the entrance, with the following particulars :—"The anchorage for vessels that require more than 18 feet, is about 1½ cable's length from the entrance, on the river's Eastern bank. There is a rock above water, near which the vessel may anchor. The bank of the river forms on the left, or Eastern side, two small coves, and has much more the appearance of an inlet of the sea than the mouth of the river.* Large vessels may anchor in 4 fathoms, a little South of the small cove.

"On ascending the river, a large mud-flat extends from the first point on its left or Eastern bank. There is a channel close on the right bank, with only from 6 to 8 feet water. Small craft that draw no more than 6 feet pass over it, and may ascend to the rocks of San Pedro, about 1¾ mile from the entrance. Higher up there are three islands, beyond which the river gets quite narrow, and is only passable for boats up to the Derumbadero of San Juan, 3½ miles from the entrance."

Fresh water is somewhat higher up than San Juan, where the river forms a basin called Agua Dulce, but the boats cannot approach within a couple of hundred yards.

The River Soco. THE RIVER SOCO, although one of the largest that flows from the mountains in the Eastern part Southward to the sea, is unfortunately impeded by a bar and narrowed in by sand-banks, covered with drift wood, so that only boats can enter to the fine basin that extends beyond the bar. Vessels of 300 tons have to anchor in 5 fathoms, distant about 3 miles from the shore, the mouth of the river bearing N. by E. or N.N.E.; smaller ones may lie in 3 or 4 fathoms. The anchorage is naturally open to the winds, and receives scarcely any protection from Point Mortero, which bears from the mouth of the river S. by E.

The embarcadero or loading-place is about a cable's length from the mouth, on the river's right or Western bank, and has deep water close in. According to my observations the house of Dona Felipe Morales is in lat. 18° 27′ 46″ N., and long. 69° 12′ 44″ W. The mouth of the river bears from here S. by E., distant about 2 cables' length.

The Port of Macoris. THE PORT OF MACORIS.—The bay, with the exception of the channel which the river has pathed itself, is a mud-flat. An islet, with a reef extending North-eastward, protects the anchorage. The channel affords here only 18 feet water, and shoals to 15 and 14 feet as soon as the South passage point is abreast. Between this point and the North passage point, lies, about half a cable's length from the former, a dangerous shoal, with only from 6 to 7 feet water on it. The mark for this shoal is the North passage point on with the second cocoa-nut tree, near the commandant's house.

If the draught of your vessel permits it, and you have cleared the outer reef on entering the harbor, keep your course for Mr. Peck's house at the North-western bight of the bay, until you have fairly opened the small sandy beach Playa Peter. The soundings give you then 12 feet. Steer for the Playa until you are abreast of the North passage point, keeping the shore on board, and go in 11½ feet water. This anchorage can only be used by small vessels, as at a short distance to the North-west from the North passage point the water shoals to 7½ and 6 feet. The rise of tide is scarcely 2 feet. Schooners and sloops requiring no more than 10 feet water, may anchor in front of the village, and ascend the river for some distance. The anchorage can only be left with a good land-breeze, and it ought to be noted that the current sets towards the shoal. The South passage point and Playa Muerto being in one, it is a mark, on leaving the bay, that you are free of the Edward's Shoal, and you may then take a South-eastern course until the reef of the Isletta is astern.

There are two small villages on the shores of the bay. The larger lies on the left or Eastern shore, and bears in common parlance the name of Mosquito y Sol. This village belongs to the district of Seybo, and surpasses in the number of houses and inhabitants La Punta, the village on the projecting right or Western point of the river, which belongs to the jurisdiction of Los Llanos. The situation of the latter is much healthier, and the prospect more open, but even small sloops cannot come close to it in consequence of the mud-flat. My observations give me for the projecting point of La Punta, lat. 18° 27′ 0″ N., long. 69° 19′ 17″ W.; according to which Punta Macoris would be in lat. 18° 25′ 50″ N., and long. 69° 19′ 25″ W. There is no fresh water in either village that can be recommended, except it be procured by ascending the river for about 2 miles.

* This supposition is perfectly correct, from what I have seen of Cumaysa at a distance of 3 miles from its mouth.

GUAYACANES.—About 8 or 9 miles to the West of Macoris is the anchorage of Guayacanes; it is an open roadstead, with a reef inside of it. The anchorage is from 1 mile to 1¼ mile off the land, in 8 to 9 fathoms, entirely exposed, but the bottom is sandy and holds well. The boats, in order to take off the cargo, have to pass the reef. There are a few inhabitants settled at the beach. *Guayacanes*

JUAN D'OLIO is equally exposed as the preceding, and the anchorage is about the same distance from the land. There are likewise some houses on the shore. *Juan d'Olio.*

MAGDALENA forms the Easternmost, and Caucedo the Westernmost point of the Bay of Andres. It is an open and bad anchorage, and vessels prefer to lie in Agua del Rey, 4 miles further inside the bay, sending their boats to Magdalena for the wood they have to take off there. *Magdalena.*

AGUA DEL REY, on the Eastern shore of the Bay of Andres, affords the best anchorage within that expanse of water. Vessels of 300 tons may lie in 5 fathoms, being protected against the East and South-east wind by Magdalena Point. The beach is good for loading; it must, however, be noted that the swell sets in with great force, in consequence of the bay being so large and open to the sea. *Agua del Rey.*

PLAYA DE ANDRES.—The anchorage is from 2 to 3 miles from the land: there is a large reef, with breakers inside, which affords a passage 9 feet in depth. The Playa de Andres is famed for the prodigious and almost incredible number of pigeons that between the months of May and October come to roost there; their numbers are so large that they may be knocked down with sticks. *Playa de Andres.*

PUNTA CAUCEDO.—There is a Derumbadero near Punta Caucedo, only approachable for boats; large vessels must lie off and on to take in cargo from here. *Punta Caucedo.*

LA CALETA, to the North-west of Punta Caucedo, although small is a very good port, where the vessel at anchor is protected against South-easterly winds. There are no dangers, and the vessel may select her anchorage from 3 to 7 fathoms. The expanse of the bay is small, and affords only place to a few ships; the landing is good. *La Caleta.*

ST. DOMINGO LIGHT is on the West side of the entrance S. 44° W., 617 yards distant from the signal-tower of the Fort. It is a fixed light, 113 feet above the sea, lat. 18° 28′ 05″ N., long. 69° 52′ 30″ W. *St. Domingo light.*

In running for this light from the Eastward, after doubling Punta Caucedo, give Punta Toreillo a berth, as there is a reef running from it to the S.W., on which, when there is any sea, it breaks.

The port is formed by the River Ozamo, where it enters the sea. There is a bar at its mouth with only 13 feet water. After passing the same, there are from 16 to 19 feet water for more than 3 miles up the river. Large vessels are therefore prevented from entering this port, otherwise so commodious and secure; for a vessel can lie so close to the shore, that she discharges her cargo by means of planks.

The bar extends from East to West; it is larger on the left than on the right bank, and ends in a narrow strip close to the rocky point, on the right or Western bank, somewhat South of the signal-tower.

The tide rises seldom to more than 20 inches, and the current sweeps with great strength through the mouth. It prevents the vessel from obeying the helm when not favored by a fair land-breeze, and has in several instances caused the ship to touch. The same danger threatens vessels on entering the river. It should not be attempted, under any circumstances, to enter the port without a pilot on board, and a good breeze to fill the sails. *Tide.*

Large vessels anchor in the roads, in from 8 to 12 fathoms water, distant about a mile from the shore. They are here exposed to the South wind, and the heavy swell of the sea. The anchorage consists of good holding ground; but should a misfortune befall the vessel, she would be sure to be smashed to pieces against the steep rocks that form the shore at this part of the coast. If the weather has a threatening appearance, chiefly during the hurricane months, all preparations should be made to be able to slip and stand out to sea.

The bank of anchoring-ground off St. Domingo is very steep, and for the first few casts irregular, 40, 15, 10, 8. After that, the soundings decrease gradually towards the shore. In coming in, give the East point a berth of two cables' length, to avoid a rocky reef with 2½ fathoms on it, which stretches off to that distance. This danger will show itself by the breakers when there is any swell.

If bound inside, keep a square white house, on the East bank of the river, twice its breadth open of the West point, on which stands the signal-tower. Keep this mark on till you are within 2 cables' length of the West point; you will then discern a low sandy spit,* running off from the Eastern side; steer directly for it and pass it close; there is no danger, as there are 16 feet at a distance of 10 feet from it; but on the

* This spit has greatly changed in appearance since the severe gale in August, 1851, when it was nearly swept away. There is still the depth of water above expressed.

other side is a sunken rock with only 2 feet on it. With the marks given above, you will carry 13 feet over the bar, and after passing the sandy spit you will have from 16 to 19 feet 3 miles up the river.

If intending to anchor outside, do not shut in the houses on the East side of the river at all, but anchor with them rather open; the last point bearing N.E. by E., in 8 fathoms, sand and mud. With the houses open, the bank extends off rather more than one nautic mile from the shore, narrowing considerably to the Westward. The bottom also becomes rocky and uneven, when the houses on the Eastern bank become shut in by the West point. The best anchorage is decidedly when they are well open.

The Port Regulations are as follows:—

Art. 1. Every master of a vessel entering from abroad shall remit to the pilot who comes on board all the letters and newspapers intended for this port, excepting the consignee's letters. It remains at the option of the master to take the pilot or not, in order to anchor his vessel in the roadstead, or to bring her into port.

Art. 2. When the health officer visits the vessel, the master will deliver the requisite bill of health, and will muster the whole of his crew and passengers.

Art. 3. After the vessel has anchored, the officers of the custom-house will come on board, to whom the master shall give up the register of the vessel and the manifest of his whole cargo; he shall afford them every facility to affix the seals, and shall allow one of their number to remain on board until the vessel has finished discharging.

Art. 4. The pilot will bring the vessel, whether with cargo or in ballast, to anchor at the proper place for its discharge, and in no instance can the vessel change place without the previous authorization of the commandant of the port.

Art. 5. The throwing overboard of ballast is prohibited to all masters of vessels, as well in the port as in the roadstead; they have to address themselves to the captain of the port in case of such a necessity, who will assign to them the proper place for its discharge.

Art. 6. In order to obtain a coast-pilot, and the necessary laborers for a vessel which is to load on the coast, the master, accompanied by his consignee, will address himself to the commandant of the port to assign them to him, and to see that a contract and advances may be made to them in his presence.

Art. 7. When the commandant of the port passes his visit, previous to the departure of the vessel, the master shall produce the passports of such passengers as might be on board, and he shall likewise deliver the fort-pass to the guard-ship before he makes sail.

To the West of the city is

Boca de Zaina. BOCA DE ZAINA.—The anchorage is entirely exposed and foul: vessels are obliged to lie off at a great distance, and the swell being at all times very heavy, calms and Northerly winds are the only period that loads can be taken off. It ought not to be included in charter-parties.

Boca Nigua. BOCA NIGUA.—Although vessels take frequently a part of their cargo in at this place, it is considered to be one of the most difficult loading-places on the South coast of Saint Domingo. The anchorage seems to be merely on a bank, with a difference in soundings of 12 to 13 fathoms by the vessel swinging to the tides or currents. A strong breeze and current forces the sea with such violence into the anchorage, that it rises from 12 to 15 feet. It is only safe to load here when the wind is from the North. The banks on shore are so steep, that such wood as lignumvitæ can be taken at once in the boat from the rocks above. A gale from any other point than North would inevitably cause the loss of a vessel lying at anchor at Boca Nigua. The miasma of the river is considered very unhealthy; indeed it is only with reluctance resorted to as a loading-place. There is a small village a short distance from the mouth, and fresh water may be procured a quarter of a mile up the river; the water is not considered healthy.

Boca de Najallo. BOCA DE NAJALLO.—The bight which the river forms at its mouth is somewhat more than a mile in extent, but the anchorage is as objectionable as that of Boca Nigua, with the difference that the landing is better than the former. The vessel lies about three-quarters of a mile from the land.

Palenque. PALENQUE.—This is the next port to the West. It would be a most desirable anchorage did the port afford more space; the vessels lie in 4 fathoms water, gravelly bottom, and well sheltered; the water is so deep, that close to the beach there are fathoms. A South wind would prevent a vessel from leaving the port, but she can get out with the usual trade-winds. A reef which stretches from the windward point S.E. and N.W., ought to be guarded against.

Boca de Nizao. BOCA DE NIZAO.—To the West of Punto Nizao is an open roadstead where vessels frequently take wood on board. The ground shallows gradually, and vessels of from 250 to 300 tons have to lie in from 7 to 9 fathoms water, at a distance

of 1½ to 2 miles from the mouth of the river. Smaller vessels may anchor in 4 fathoms, but it must be recollected that the sea breaks often a great distance from the shore.

This anchorage is no more dangerous than other open roadsteads along the coast; indeed more vessels load here than at Bani and the other Southern anchoring-places.

The tide runs frequently with a strength of from 4 to 5 knots, and renders the loading of the vessels somewhat tedious. It is next to an impossibility for a boat to enter the river; the current sweeps out with a very great force. On proceeding, therefore, from on board to the place where the rafts of wood are to be made up, it is better to land the people at Palenque, and to let them walk over land to Nizao. With regard to these local arrangements, however, and the manner in which the raft of wood is to be got on board, it is best to trust to the orders of the pilot, and to the laborers acquainted with the management.

The water of the river is good, and may be procured fresh a quarter of a mile from the mouth. There is at a short distance from the shore a small village.

Puerto Viejo

PUERTO VIEJO.—On entering from leeward keep close to a remarkable white cliff, which forms the South-western point of the great entrance, and where there are 9, 8, 7, 5 fathoms water, until you have passed that point. The passage to the inner port or Boca Corillo is between this point and a reef which lies nearly West from the great entrance. Keep the mid-channel between the Northern cliffy shore and the South side of this reef. The water shallows gradually to 3 fathoms. Let go your anchor at 4 fathoms, the reef bearing North.

The Eastern anchorage is exposed to the South-east wind. You may anchor in 3 fathoms, South of the loading-place, the high mountain Martin Garcia bearing South-west.

Punta Catalina.

PUNTA CATALINA is not much frequented as a loading-place. There is no anchorage on the East part, but on the Western small vessels may anchor in 3½ fathoms. To the South of Punta Catalina, distant one mile, is a shoal, with only 12 feet water over it, which ought to be guarded against when beating up the coast. Punta Palenque forms the Eastern point, and Punta Catalina the Western, of a large bight which contains Boca Nizao and Puerto Viejo as loading-places in that extent of the coast.

Savana.

SAVANA.—About 3 or 4 miles West of Punta Catalina is Savana, where large vessels may anchor with safety in from 5 to 6 fathoms; the anchorage is good, but to the windward only protected by Point Catalina, which bears about E.S.E.

Paya.

PAYA is an open roadstead, shallowing very gradually, so that a vessel of 200 to 300 tons has to lie at a distance of from 2½ to 3 miles. It is much frequented as a loading-place.

Aqua de la Estancia.

AQUA DE LA ESTANCIA.—It is the anchoring-place of the village Bani, and is, like the former, an open roadstead. The vessels have to lie at anchor at the same distance, but it is good holding-ground, consisting of mud and weeds, with sand.

Estancia Colorada.

ESTANCIA COLORADA.—Somewhat further to the Westward is La Estancia Colorada, to which the same remarks refer that have been made with regard to the previous place.

La Salina.

LA SALINA.—The soundings are from 15 to 18 fathoms, at a distance of a cable's length from the shore. Two mountain cabbage-trees kept in a line with a large sea-side grape-tree, bearing then between E. and E. by N., are a mark for a good anchorage. Small vessels anchor in 5 fathoms, with a hawser ashore, for fear the anchors might not hold. The depth increases so suddenly, that with 5 fathoms forward, the vessel will probably have from 18 to 20 fathoms over the stern.

La Caldera.

LA CALDERA.—This is one of the finest ports on the South coast; a vessel may here anchor in from 15 to 3 fathoms water, as it best may suit her.

Playa Vieja.

PLAYA VIEJA.—Outside of La Caldera, about N. by E. from La Salina, is Playa Vieja, affording a good anchorage under the hills of Ocoa. The bottom is so clear that it may be seen in 6 fathoms water. Three or four hedges of mango-trees, that are visible at a great distance, are a good mark for this anchorage.

Ocoa.

OCOA.—This beautiful bay affords an excellent and well-protected port near the mouth of the river of that name. You may anchor close in on either side of the river, but the Northern is preferable. A whole fleet may anchor here in safety.

Caracoles.

CARACOLES.—At the bight of the bay of Ocoa, you have to anchor at the distance of 1½ mile from the shore, in 5 or 6 fathoms of water. The landing is good, but the large bay is sometimes subjected to a heavy swell when the breeze is Southerly.

Azua, or Tortuguero.

AZUA, OR TORTUGUERO.—The sea sets into this anchorage with great force. When the breeze rises, the vessels labor much, and the boats seldom can go off with wood to the ship after 11 o'clock in the morning. There is no room for working a vessel in the bay. On the Western point is a reef, and near the East point is broken

ground. Vessels leave the bay with the land breeze. Tortuguero is the port of Azua, and is considered to be a tolerable good anchoring-place.

Puerto Viejo de Azua. PUERTO VIEJO DE AZUA.—This is an excellent port for small vessels, where they lie quite land-locked. It is only 12 to 15 feet water at the entrance, but for such vessels as require no greater depth, it is one of the safest ports in the republic.

The Bay of Neyba, or Juliana. THE BAY OF NEYBA, or JULIANA, extends from Punta Martin Garcia to Punta Truxillo, 9¼ miles, and has a depth of 8½ miles; the largest vessels of war may anchor in the bay, along its Eastern coast. It contains the anchorages of Rancho del Cura and Bahia Elejandro on the Eastern, and the port of Baraona on the Western coast. The river Neyba, or Yaque, enters the bay N. 84½° W., 10 miles from Punta Martin Garcia. The ground shallows to 11 feet, and has a bar with less water, which prevents small sailing-vessels entering the river. Its course has been very changeable, and formerly it entered the bay further Southward, in several arms.

Rancho del Cura. RANCHO DEL CURA.—At the distance of one mile from Punta Martin Garcia, in the fine bay of Neyba, and a little to the North of some red cliffs, is a very good anchorage under the above name. You lie 2 cables' length from the shore in 5 fathoms, protected by Punta Martin Garcia from the East winds. To the North of the anchorage are some white cliffs, almost equidistant from the anchorage and the red cliffs.

Bahia Alejandro. BAHIA ALEJANDRO.—The anchorage is very exposed, and there is a reef inside. It is not a desirable place for loading vessels.

Baraona, or Barahona. BARAONA, or BARAHONA.—This harbor offers a very good anchorage, but the vessels ought to await a pilot to lead them through the passage between the reefs. On entering the bay of Neyba, and being abreast of the red cliffs, hold a W.S.W. course for the entrance; the water is bold close in to the reef. At four cables' length from the reef you have no bottom with 120 fathoms, and it suddenly shallows to 5 fathoms and 10 feet. When you are within 2 miles of the reef, you will discern the village very plainly, and you will note above it two ridges of hills, one overtopping the other; each ridge has a saddle or hummock, in a direction of nearly W.S.W. with the village; keep these two saddles in one. Coming close to the entrance, your soundings being probably 10 fathoms, you will note on the square of the little village a house, larger and more prominent than the others, with a palm-tree before it, standing likewise in the square. Bring that palm-tree on a line with the Northern gable end of the house, or with the gate that leads to the yard, bearing then S. 69½ W., and let go your anchor. After having cleared the weather reef in 5 or 4 fathoms, there is a good anchorage in 7 to 8 fathoms, the little islet bearing West; and sometimes vessels anchor much closer inshore, in 22 feet, but some sunken rocks, called the fishing-rocks, may prove of danger in getting the vessel under way. The reefs possess several passages for schooners and smaller vessels. The village of Baraona is in lat. 18° 12′ 2″ N., and long. 71° 5′ 45″ W.

Baburuco. BABURUCO.—This place ought to be avoided, although vessels have loaded there at various times. Baburuco is not a proper shipping-place for large vessels, and masters should be careful in accepting any charter in which this place is included. There is scarcely sufficient room for a vessel to lie at anchor, and with the wind blowing on shore, there is not sufficient opening to tack out. Moreover a very heavy sea sets into the anchorage. The vessels are anchored in from 12 to 17 fathoms, at a distance of one mile and a half from the shore, with a reef towards the South of the anchorage, and one to the north. The shore is uninhabited.

Mala Pasa. MALA PASA.—About 3 miles S.W. of Baburuco is Mala Pasa. It may be easily recognized by its steep white cliffs. It is less qualified for an anchorage than Baburuco; the same refers to Paradise and Petite Banane.

Riocito. RIOCITO is about 5 miles from Mala Pasa. The water is so deep that the vessel is obliged to anchor close in, which renders her situation dangerous; the anchorage is moreover exposed to every wind, and all the sweepings of the sea. Vessels have loaded here to my knowledge, during fair weather, but it cannot be recommended as a loading-place. After Riocito follows

P. de Carlos. PUNTA DE CARLOS, and

Petit Trou, or Ajugero Chico. PETIT TROU, or AJUGERO CHICO.—A long reef, about 3 miles in extent, encompasses this anchorage. This barrier has two passages; the windward passage is about 2 cables' length in width, with several sunken rocks, one of which has only 10½ feet water, but there is deeper water on both sides; this entrance is called the reef passage. The lower entrance, or sea passage, has 18 to 20 feet, but the room within, having once cleared the passage, is so narrow and impeded by sunken rocks, that no vessel could beat up to the proper anchorage; it is therefore only of use for vessels that stand out to sea. A vessel bound for Petit Trou, ought not to draw more than 10 feet and a half. In approaching the reef you should shorten sail, to prevent the vessel going too quick through the water. The time for passing through the passage ought to be between 11 o'clock in the morning and 1 o'clock in the afternoon, when

the sun is high, and shows the rocks under the water more clearly. The pilot stands in the bowsprit, and gives directions how to steer the vessel through the rocks (some of which are only covered with 6 and 7 feet water) to the anchorage. It is therefore requisite to have a clever and quick person at the helm.

The ground for anchoring is not very good. There is scarcely a berth to be found where the vessel with 70 fathoms chain can swing round, without striking a rock; it is therefore advisable to moor the craft. The bottom shallows gradually, and at a distance of 1½ mile from the land there are only 3 fathoms water. The breeze blows fresh from the North-east, and the weather is uncertain and squally. The North-easterly breeze sets in about 2 o'clock in the morning, and continues to blow from that quarter until half-past 7 or 8 P. M., when it veers more to the Eastward, and blows from E. by S. until midnight. During increasing moon the current sets regularly for 12 hours with the ebb to the East, with a velocity from three-quarters to one knot per hour. The flood rises at Petit Trou above 3 feet. During a decreasing moon the flood sets uninterruptedly towards the West, and there is no ebb at all. It runs then with a velocity of from one to one and a quarter knot.

In spite of these drawbacks, vessels load frequently at Petit Trou, and a person acquainted with the dangers he has to meet, will take accordingly the requisite precautions, if that place should be included in his charter party. A careful master will lie to when he has the slightest mistrust in his pilot, and sound the passage, placing moreover a buoy on the 10½ feet rock, which presents the greatest danger to a vessel on entering. I have already observed that the sea passage affords more water and less danger. It is nevertheless necessary to be cautious when standing out to sea, as there are sunken rocks in the course before the reef is cleared.

Petit Trou is the most Western loading-place that, on the South coast of the republic, is at present resorted to.

From Petit Trou to Cape Tiburon.

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. *Beata Vela.*

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 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., 4 miles. *Isle of Beata.*

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 5 leagues South from Beata Point, in lat. 17° 28′, and long. about 71° 38′. 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. *Altavela.*

At the distance of 2½ 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 danger

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. 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 Pitre Cove, which constituted the old limit between Hispaniola and Hayti. At this place is a good anchorage, which it is easy to make, 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 further 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 à Pitres, or Pitre Cove. All the coast is clear, and may be approached with great safety, as noticed above.

There is good anchorage at the Anses à 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 à 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 Rouge 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. 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 Guachée, which has several mouths in the beach. In the middle of the bay no bottom is 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. 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.

Leighton Rock. LEIGHTON ROCK, of 3 feet water, is in lat. 17° 45′ 9″ N., long. 73° 21′ W. South 28° 06′ E., 19 miles distant from South end of Isle Vache.

La Vache. LA VACHE.—From Cape Bayenette to the East point of La Vache, the bearing and distance are W.S.W. ½ W., 13½ leagues. The isle is 3 leagues long and about one broad; it is hilly, and at the distance of 6 or 7 leagues, appears like an assemblage of small islands. The South side is bold, and along the North a reef extends to the distance of a cable's length. From off the East point is a white shoal, connected with the 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., 5 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 2 miles from shore.

Remarks on the Anchorages within La Vache.

"The N.W. point of La Vache is in latitude 18° 6′ 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 anywhere, 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 2 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 N. 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 seaside; 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, between La Vache and Aux Cayes, the bay is covered with large reefs, and several are above water."

The Cayes, St. Louis, &c.

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, 4 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 further to the Northward, opposite a sandy cove, in from 6 to 7 fathoms, 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 port 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 2 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. 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. 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 the hurricane months. There is a good careening-place, and anchorage in every part.

Baie du Mesle. BAIE DU MESLE.—From Flamingo Bay the coast extends E. by N., 2 miles, to the Grande 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 the 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 Point Pauline, which forms that side of the entrance.

Bay of St. Louis. 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 13 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 1¾ mile.

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. The anchorage is West of the Old Fort, about a quarter of a mile from the Western shore, and the town may be seen from it, between the Old Fort and shore, in the bottom of the bay. 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 6 fathoms.

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. 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 inshore. 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 à Ramiers, (or Pigeon's Key,) which bears E. by N., 2 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 La Regale; the three form an equilateral triangle, having each side half a league in length.

E.N.E., three-quarters of a league from Caye à Ramiers, lies the West end of the Great Key of Aquin, which is 2 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 à 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 2 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., 1¼ league from the Tapions of Aquin.

To enter the passage into Aquin Bay, between Caye à Ramiers and Moustique Key, before-mentioned, steer N.N.E., so as to get into the mid-channel between the shore and the island. Having doubled Caye à Ramiers, you will see La Régale, which is a very low isle of sand; leave this on the starboard side, keeping in mid-channel between it and 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 further 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 Bayenette. 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 Bayenette the coast is iron-bound, and the water near it of great depth.

Point Abacou to Cape Tiburon.

POINT ABACOU TO CAPE TIBURON.—From Point Abacou to Point 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 further 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 2 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 Anglais, 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 des Vieux Boucans, 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 everywhere 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.

Ports and anchoring-places to the North of Punta Engaño.

The following anchoring-places, Cabeza de Toro, Bábaro, Los Ranchitos, and Arena Gordo, come nearly all under one and the same category with regard to their practicability as loading-places. During the summer months, when the trade-wind is to the South of East, and calms are prevailing, there is no danger to be apprehended, and vessels load in as short a time as anywhere on the coast; but during the winter months, when North-easterly winds are frequent, the vessel is not only endangered, but the loading is rendered difficult, as days and days may elapse before a boat can pass from the anchorage to the land. Nevertheless, a vast deal of wood is loaded at the North-eastern anchoring places, and the master who has accepted a charter-party in which one or the other of the above-named places is included, ought to be provided with good chains.

Los Algodones. LOS ALGODONES.—The first rocky point to the North of Punta Engaño, is Los Algodones, which does not afford any anchorage.

Cabeza de Toro. CABEZA DE TORO.—The quantities of wood in the neighborhood of this anchoring-place cause it to be frequently visited by vessels. The reef affords two passages; the one to the leeward, called La Naybe, is even passable for schooners that draw no more than 10 or 12 feet. Large vessels anchor outside the reef, in from 10 to 12 fathoms water, sandy and rocky bottom.

Bábaro. BABARO, about 6 miles from Cabeza de Tora, is considered a better anchoring-place than the former; the sea is somewhat calmer and the reef approaches more the land. Vessels lie in 10 to 12 fathoms, distant 1½ to 2 miles from the land. The beach is sandy, and the loading may be effected rapidly when there is no North-easterly breeze or heavy ground-swell.

About nine miles North-easterly from Bábaro are :

Los Ranchitos. LOS RANCHITOS.—The reef has two passages with about 4 to 5 feet water. Vessels lie outside in 11 or 12 fathoms of water, distant 1½ to 2 miles from the land. It is a sandy beach and a good loading-place.

Arena Gorda. ARENA GORDA, about 2 miles from the former, has three passages through the reef, which a small sloop with 5 feet water can safely pass, to the anchorage within; vessels of large burden lie from 1½ to 2 miles, according to their size, in 10 or 12 fathoms water.

Macao. MACAO.—All the remarks respecting Bábaro, Cabeza de Toro, &c., refer equally to Mácao. The anchorage is here still further off the shore than at Bábaro, and the place is much more exposed to the winds and sweepings of the sea. The vessels anchor about half a mile North of the reef, which stretches from Cabezote Barlovento in a line towards El Infiernito, and send their boats for the wood to the bight of the bay and to the mouth of the Anamuya. The two rocks high out of the water, called the Cabezotes, are excellent landmarks, and afford along them good boat-passages. The passage for the bight of the bay, where there are some ranchos for the shelter of the laborers, is between Punta Mácao and the Cabezote Barlovento; and that for the mouth of the Anamuya close to the Cabezote Sotavento, likewise called El Infiernito. At the mouth of the Anamuya is a bed of excellent oysters.

The position of Punta Mácao, deduced from observations taken near the ranchos, is in lat. 18° 48′ 0″ N., and long. 68° 29′ 50″ W.

There is an anchoring-place between Punta Mácao and Cape San Rafael.* The latter cannot be mistaken. Nearly 2 miles inland from the cape is a round hill, which, at the distance, has the appearance of being isolated ; it is, however, connected with the Southern shore of the bay of Samana by low land.

Port Jicaco or English Harbor. PORT JICACO or ENGLISH HARBOR.—Port Jicaco or Engltsh Harbor, (Puerto de los Ingleses,) lies about 11 miles W. by S. from Cape San Rafael. A rock, which rises above the reef stretching from Punta Jicaco towards the Keys, is seen at a distance of 2 leagues, and serves as a mark to point out the passages Barlo and Sotavento. At the same time a high double-peaked mountain will be observed inland, bearing S. by W. ; keep the hummock between the two peaks as your mark, and come to anchor in 5½ and 6 fathoms, distant a quarter of a mile from the land. The anchorage within the reef is safe, and has the advantage that the vessel can leave with the trade-wind, selecting the lee pass for her passage when standing out to sea.

Cape Samana. 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. SAMANA BAY.—There is good anchorage in Banistre, or Lavantados 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 further 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 bound 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 Valandras, 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

* Lieut. Raper, R.N., gives, in his table of Maritime Positions, (1849,) for Cape San Rafael, lat. 19° 1′ 0″ N., long. 68° 55′ 0″ W.

high and woody, a mile from you on your port 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 Lavantados, or Banistre Key, will bear W. by N., one 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.

SAMANA BAY.—From Cape Rafael 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 peninsula, named Cape Samana, lies 7 leagues N.W. by W. ½ W. from Cape Rafael. 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 Key Lavantados, must be left on the port 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 Carenera Chico, (or Little Carenage ;) to enter and anchor here, it is necessary to approach within half a mile of Point Valandras, 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 Lavantados 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 2 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 are 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 there are two off the North coast, 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 further from Point Gomero, than half a cable ; for you will thus run in mid-strait ; and by keeping further off, you would incur the risk of getting on the Southern reefs, or, by coming nearer, get on those of Point Gomero, which lie out one-third of a cable. So soon as past Point Gomero, you may see a a little rivulet in Aguada Bay ; and then you ought to head 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 2 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 further in there is sufficient 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 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, as 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, 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. ¼ 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.

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.

Old Cape François.

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 Casrogue 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 coasts 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 further 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 seaside, 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 lying 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, Puerto de Plata.

Puerto 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. In running in, keep midway between the points; and as soon as round the point, on the port hand, let go your anchor, in 3½ fathoms. There are not now any mangrove bushes.

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 Casrogue, which is readily known by its magnitude.

The bight from Port Plata to Point Casrogue, 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 Casrogue, 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 Casrogue, 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.

YSABELLA, or ISABELLA POINT, according to 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 Casrogue Point. To the Eastward of it lies the deep bight, called Puerto Caballo, or 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 easier 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 Roca, 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 Roca, lies about 4 leagues from Isabella Point.

The Grange.

THE GRANGE.—The Grange Point is known by the mountain of that name, and is seen at a great distance before you perceive the 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. 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.

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. 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.

MONTE CHRISTI REEF.—About 3 leagues to the Westward of Haut-fond lies another reef. 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 are 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 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 further 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 anything 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.

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, which is low, and bears S.W., true, 5 miles, from Grange 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 port 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 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 Chris i : 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.

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 port 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 leading 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.

Tide.

The Harbor Guarico, or Cape Haytien.

THE HARBOR 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 as that they may run down towards Point Picolet, with a 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 port 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 Point 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 to 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 port hand 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 10 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 port 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 port side. You must, therefore, have sufficient sail to outweather round the Grand Mouton Bank, giving a 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 the night; but, at about 10 or 11 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 François. 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 a small bay, and about 2 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 2 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. 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 them, 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 as 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 2 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 4 cables' length within, the channel begins to widen, so that when Rat 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 Island bears S. by E. ½ E., and 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 port 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 entering by this channel when the winds allow you to shape the proper courses; but if you cannot do this, you ought not to attempt it, as there is not room to work 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 port, 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 Great 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 Bouchand 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 3 cables' length, for it is foul and shallow; and as 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 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 3 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 à Chouchou, or Chouchou Bay.

ANSE A CHOUCHOU, or CHOUCHOU BAY.—To Point Limbe follows that of Margot, which has a round islet, lying rather further out than that of Limbe. It is very useful to make this islet, in order to direct yourself to Chouchou Bay, which lies 2 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.

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 extend half a league out to sea.

Port Paix.

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 Port 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 3 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.

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 one from N. to S. All its North side is ironbround, 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 Bassaterre, 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 port 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 of the reef, upon white ground, a mile to leeward of Bassaterre.

To the Eastward of Bassaterre, towards Portugal (or the East) Point, there are several bays or coves, in which boats or schooners may anchor, but nothing of 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 stand 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 inshore.

Port Paix to St. Nicolas' Mole.

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 à 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 2 cables' length from its Eastern point, and upon which there are not more than 3 fathoms water. To enter 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 à l'Ecu is the anchorage of Jean Rabel, which is good, safe, and easy to enter. On approaching this place you ought to near the reef on the East side, which has 10 fathoms close to its edge. The anchorage for large ships is about 2 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 further in, yet it is not advisable, as 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 further out 80 fathoms.

From Jean Rabel the coast forms a great bight to the Southward, as far as the peninsula called Presque 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 2 leagues in the offing they are less so, and run to the North-east. Near the peninsula they are much stronger, and commonly set towards the North.

St. Nicolas' Mole, Bay, or Harbor.

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 has 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 further 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 further to the Southward you will then descry the Pointe du Cap-au-Foux, or of Fools' 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 Pointe de 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.

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 Pointe du Cap-au-Foux, or Fools' 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 Pointe 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 inshore set to the Northward, and 2 leagues in the offing, to the W. and W.S.W.

Platte-forme, or Platform, &c.

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 2 cables' length. Without, 10 fathoms soundings will not be found. The bay is very convenient for cruising-ships to heel and boot-top in, &c.

From the Platform Point to Point 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 2 or 3 leagues, so that you may, with any wind, keep to the Westward.

Gonaives.

GONAIVES.—The bay of Gonaives is very large and fine, the anchorage excellent, and the entrance very easy. You range along the shore, at half a league or 2 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 2 miles from the Débarcadaire, (or landing-place,) you will have 6 fathoms. After you have doubled the point, leaving it on your port hand, you will see Fort Castres 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.

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 Castres, 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 Castres, which stands on the North side, on the top of a small hill, about one 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. You may go so far up the harbor as to have Fort Castres 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 Castres, 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. MARK.—From Point Pierre, without the entrance of the bay of Gonaives, the distance to Cape St. Mark, in a direction nearly South, is nearly 7 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 Pointe du Morne au Diable, or the Devil's Bluff Point: it points out the mouth of the River Artibonite, which falls into the sea 2 miles Northward of the point. There is an anchorage the whole length of this coast for small vessels only. *St. Mark.*

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 seaside.

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 2 miles from a bluff point to the S.E., and on which a reef stretches out about 2 cables' length from the coast.

The following Description of the Navigation between the Platform and St. Mark, is given by Capt. Hester, an English navigator.

"About 9 leagues Eastward of the Platform is the fine bay in the 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 port 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 2 leagues to the Southward of Gonaives is Artibonite Point, and 2 leagues further 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. ½ E., you will 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, 3 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., 2 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, 5 or 6 miles up the river; there you can have good water, but no wood. The sea-wind comes on at noon, at N.W., until 10 at night, and the land-wind at E. by S., until 8 in the morning."

From St. Mark's Point the coast of Hayti trends nearly S.E., true, 6½ leagues, to La Souffrière, or Vazes Point; and thence E.S.E., 5 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 water. In proceeding thus, you will first perceive the magazine of Moutroui, and afterwards the villages of Arcahais, or Arcahaye, and

Boucasin; 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 situated 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 Boucasin, 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 2 leagues to the Southward of this island is the roadstead.

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 2 miles from Foso Roadstead, and the Southernmost 3 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 4 miles from Foso Road, and 2 from Lamentin Point.

Port au Prince. PORT AU PRINCE.*—The shore at the bottom of Port au Prince 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 Gonaive: the first appears to be the best route, for thus the foul grounds on the S.E. side of Gonaive 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 Gonaive. If you can foresee the gale, it will be best to gain an anchorage near Arcahais Point, and there ride it out; or, you may anchor to the Northward of Leogane, on the South side of the channel, upon the ground extending from Gonaive Island, as shown in the chart.

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 4 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 2 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.

From Pearl Point the entrance of St. Mark's Channel, midway between Cape St. Mark and the island of Gonaive, the course and distance are S.E. ½ E., 16 leagues. This will bring you to the Westward of Cape St. Mark, for which you may steer; or, you may continue the same course 6 leagues further, 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 Gonaive Island. Having run about 4 leagues on this track, the course will be about S.E. by E., 5 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 Gonaive as to the St. Domingo side: the latter being safe, may be approached anywhere, 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 S.W. 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.

Gonaive Island. GONAIVE ISLAND.—The greatest length of Gonaive Island is 10 leagues E.S.E. and W.N.W.: its breadth, which is very regular, is nearly 2½ 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:

* See Plan by Com. R. Owen, published by E. & G. W. Blunt, 1833.

The most dangerous reefs are those which lie to the S.E. of Petite, or Little Gonaive, which is situate near the S.E. point of the great island. These seem to be joined with the land of the Little Gonaive, 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 Gonaive; 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 Gonaives.

Small vessels, drawing 8 or 9 feet water, may find a good anchorage to the West of the Little Gonaive, which may be best entered from the Southward.

The N.E. point of Gonaive, called Galet Point, is low, and bordered with a reef, which stretches along the East coast, towards the South, and extends 1,100 toises, (1,170 English fathoms,) opposite the place called Trou à 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 à Galet, or Galet Cove, in case the wind should fail. There is anchorage everywhere; 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'Isle à 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 iron-bound coast, alongwhich you may range pretty near; but it is not so from the S.W. point of Pointe-à-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 Fantasque, 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, its true situation having never been well ascertained: it lies in the channel which separates the South coast of the Gonaive 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. *Rochelois.*

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 2 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 Gonaive, 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 four observations, is 18° 37′ 20″ N.

PORT AU PRINCE, to the WESTWARD.—On leaving Port au Prince, when bound to Petite Gonaive, 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. *Port au Prince.*

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 bays of Grand Gonaive

and Petite Gonaive, which are separated by a point and a hill, named the Tapion, or Hummock of Gonaive. You enter into Petite Gonaive Bay, by leaving on the port 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 Gonaive is 10 leagues from Port au Prince; but, as you are forced to double Point Leogane, the run is longer.

Miragoane. MIRAGOANE.—From the Hummock of Petite Gonaive to the Tapion du Trou Chouchou, or Hummock of Miragoane, the coast runs West, 8 miles; thence W. ½ S., 6½ miles, to the careening island, or Miragoane Bay.

Bound to Miragoane, and off the West end of Gonaive, give it a berth of 3 or 4 miles, and steer E.S.E. or S.E by E.; or keep the Gonaive side of the channel best on board to clear Rochelois. Steer up in the same way until the highest hummock on Gonaive bears North. This hummock is the Western part of the table-land, so called, and from the West end of Gonaive appears like a high mountain. When this highest land bears North, steer S. or S. ½ E. for Miragoane. The land about Miragoane may be known by a remarkable clearing up and down the side of the mountain, presenting the appearance of a long narrow grass-field scorched by the sun. This is 6 or 7 miles to the East of the town. Continue standing in for this mark until near the land, when the town of Miragoane may be seen to the Westward.

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-à-Veau and Petit Trou. From the last, the coast forms a large bay, Baradaires.

Baradaires Bay. 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., 4 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 5 or 6 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 you going in without a pilot, well acquainted.

The Caymites. THE CAYMITES, &c.—The Northern extremity of the Bec du Marsouin, and the North part of Grand Caymite Island, bear nearly W.N.W. and E.S.E., 4 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 Plamand'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 2 or 3 feet of the surface of the water, so that no vessels but very small ones, ever attempt it without a pilot. These white shoals extend 3 leagues W.S.W. from the Grand Caymite.

Jeremie. JEREMIE.—From the North point of the Grand Caymite to the Point Rivière Salée; or Cape Rosa, which is 1½ league W.N.W. of Point Jeremie, is 9½ 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 à 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 10 fathoms, weedy bottom. *Cape Dame Marie, or Donna Maria.*

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 Pointe 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.

POINTE 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 Baie 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. *Pointe de Irois, or Irish Point.*

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 Débarcadaire, 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-au-Foux, or Fools' 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.*

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 lat. 18° 19′ 25″, long. 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 further 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 anywhere 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.

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. NAVAZA is about 2 miles in length, E.S.E. and W.N.W., and about 1¼ mile broad at its widest part. Lat. 18° 25′ N., long. 75° 2′. 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 from 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. ½ W., 23 leagues.

The Formigas, or Ants. 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 Plantain 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 named 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 botrom be clear. *The Morant Keys.*

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 N.E. 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 bearing may direct in turning or sailing.

The cocoanut-trees formerly on Morant Keys have been cut down, 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, 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 Guadaloupe, but they may pass it with equal safety between St. Bartholomew's 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 Altavela, 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 Altavela, 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 à 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 à Vache lies to the Eastward of Point Abacou, and forms the channel to Aux Cayes, &c. From Altavela to the East end of the Isle à Vache, the bearing and distance are W. by N., 42½ leagues. From the East end of the Isle à Vache to Point Abacou, W. by S., 14 miles; thence to Point à Gravois, W. ½ S., 2½ leagues.

When off at sea, abreast of the Isle à Vache, the middle of a saddle mountain over Port St. Louis bears nearly N. by E., and then the Eastern end of Isle à Vache is between it and the ship. The island is low, though hilly, and lies so under the land of the main, that 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 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 à Vache.

From Point à 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 à Gravios 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 Altavela, be cautious of running too far North, lest you should get on Morant Point, this point being 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. Light.

MORANT POINT.—On this point there is a revolving light, 113 feet above the level of the sea, which can be seen in clear weather 21 miles. Yallah's Hill bears from the light-house W. ¾ S.; North-east Point, N.W. ½ N.; and the Morant Keys, S.S.E. ½ E., 33 miles distant. Latitude, 17° 56′ N. Longitude, 76° 11′ W.

Morant Point to Kingston.

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., a W. by S. course 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 S.E. 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 1½ cable, with 19 feet on it.

Having passed the point, steer to the Northward till the Admiral's Penn comes to the North of Gallows 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 from 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.

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 1¼ 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.

Beacon.

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 best 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-breeze.

The anchorage is good all over Port Royal Harbor: but the best anchoring for ships that are bound for 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.

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, as 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

for heavy ships, 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 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 3 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 flagstaff 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 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.

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 for safety.

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 further 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 lie 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.

NEW CHANNEL OF PORT ROYAL.—The New Channel lies to the Eastward of the South Channel, and almost parallel to it; it is 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 until 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 until 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. As 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 is a very small spot, with no less than 24 feet water on it, and deep water all around. Ships of 20 feet draught 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.

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 remarks, "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."

Old Harbor, Long's Wharf, &c.

OLD HARBOR, LONG'S WHARF, &c.—Mr. Leard's directions for these harbors are as follows: Being clear of the South or New Channels, steer to the Southward, or S. by W., and give Wreck Reef a berth of 2 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 7 and 6 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.

The most frequented and best channel for entering into this great bay, is between Pelican and Bare-bush Keys; and to enter it, those who come from Cow Point must steer W.S.W. ¼ W., 9 leagues, 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 form, is the point to be used as the leading-mark, bearing W. by N., as above.—*Derrotero, &c.*

Buoy. There is a black buoy on the S.W. Pelican spot.

Long's Wharf and Salt River. *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; 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 the 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. *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 port 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. 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 2 or 2½ 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 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 5½ fathoms, good holding-ground.

Peake Bay. *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. *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 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. *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 2 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 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 stand-

ing 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 to 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 2 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 2 or 2½ miles, or 7 or 8 fathoms; for the reef off Rocky Point, which is the West part of Portland, extends nearly 2 miles from the point to the Southward.

It is said, that about thirty years ago ships sailed over Morris' 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 4° open, and North part of Bare-bush Key bearing E. ¾ S. Marks for the West end are, Cudjoe Hill, on the before-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 suddenly for your lead to be a guide in standing towards it.

Port Royal to Portland.

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, nor 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.

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 Easternmostland 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.

The Portland Rock.

THE PORTLAND ROCK is elevated from 15 to 20 feet above the level of the sea. H.M.S. 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″ difference from De Mayne's meridian distance reduced; he having considered Port Royal in 76° 52′ 28″ W., whilst we use 76° 49′ W.

We stood from the Portland Rock to the S.W., carrying from 12 to 15 fathoms, and having these soundings further 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 2 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 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.

THE SOUTH-WEST BREAKERS.—They are dangerous, and require a strict lookout. The sea breaks over two small rocks, not more than 3 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 mast-head lookout, we passed within 3 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 6 miles. When the breaker bore S.S.W. about that distance, we tacked, and stood for it; and when about 3 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 9 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 is remarkable even in soundings, and I should be for this reason cautions 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.

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 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 2¼ 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 20 miles from Carlisle Bay, at a mile or a mile and a half from the shore, there is a regular depth of 4 and 4½ fathoms.

Alligator Pond Key.

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 4 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.

BRUNE BANK, a small bank, having on it a little more than 4 fathoms, with 12 or 13 close to it, lies 6 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.

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.

Entrance of Black River.

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.—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. *Port Royal to Black River*

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 Bluefield's 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.

South, 4 leagues from Bluefield's, lies a rocky bank, discovered in 1821, with from 13 to 20 fathoms on it.

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 Bluefield's, 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 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. *Bluefield's Bay.*

In steering in, keep the lead going, and be ready to anchor, as the water shoalens rather suddenly.

SAVANNA LA MAR.—The coast from Bluefield's to Savanna la Mar is rocky, in some places, to the distance of 2 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 water. This channel should never be attempted without a pilot. *Savanna la Mar.*

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 be keeping one-half of the highland 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 Bluefield's, 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 deepens 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 wish to make, should vessels get into the first of these depths. The anchorage of Savanna la Mar is of the same nature as that of Bluefield's: 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 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 as 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. 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 droghers, &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.

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 .

Between Negril and North Pedro the coast is bold, excepting at Green Island, which 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 8 or 10 miles off.

Harbor of Lucea. 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 3 miles from the 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 the 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 for the 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.

MOSQUITO COVE, an excellent harbor, lies 3½ miles to the Eastward of the harbor of Lucea. Here a hundred sail of merchant-ships may lie secure 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.

MONTEGO BAY.—The Northern point of Montego Bay lies in lat. 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 2 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 1¼ mile from the shore: advance, therefore, no nearer to the point Northward of Old Fort Point than 2 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 lie to load; a shoal extending nearly the whole of the way across, which affords a 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 ship's going into the inner harbor, at Montego Bay, she is charged one-halfpenny 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, it is best to leave the bay in the evening, as soon as the land-breeze comes off, which will generally run you clear of the bay, and in a good offing for the sea-breeze. It is generally best 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 inshore 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-breeze will lead you to the Eastward.

Peak of Tarquino.

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. ¾ N., distant 35 leagues; from St. Anne's Bay, N. by E., 28½ 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.

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 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.

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. Within a league to the Eastward of this is the small harbor of Rio Bueno.

Rio Bueno and Dry Harbor.

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. ½ W., in 9, 8, or 7 fathoms. Dry Harbor, which lies 3 miles more to the Eastward, is a good harbor for small vessels, although its channel be narrow, and has a depth of only 16 feet.

St. Anne's Bay.

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 edges 3 and 3½ 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. ¾ 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 the 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.

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. ½ 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.

ORA CABECA, 10 miles to the Eastward of Ocho Rios, is another anchorage, exposed, like the former, to North and North-west winds. To sail in here when advancing from the Eastward, first make Galina Point; in order to do which, when off at sea, bring the Westernmost highland 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.

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 MARIE.—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 2 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 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. *Port Marie.*

From Port Marie 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 Marie, 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. *Anotta Bay.*

Anotta Bay is an extremely unhealthy place; so is Port Maria; but Ora Cabeca is a tolerably healthy situation.

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. 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 half a mile in length. *Port Antonio.*

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, 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 store-house, 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. *Tides.*

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.

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.

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.

The GRAND CAYMAN is about 8 leagues long, and 2½ 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 1½ mile 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 W. 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 is generally imagined. The North side forms a bay, across the mouth of which runs a reef of sunken rocks, which may be readily seen in the daytime, before you are near enough to run any kind of risk. It is impossible for anything 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 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 purchased. 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 have 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 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 until then."

The Grand Cayman is inhabited by many persons, descended from the old buccaneers, 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, cocoanuts, &c., but no beef nor mutton. Water is procured by filling a bucket about 20 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 ran 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, 1½ mile 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 raise the Little Cayman, of which you will at first discern scarce anything, except three large cocoanut-trees on the East end, and which, at a distance, appear like two vessels at anchor. These cocoanut-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. *Cayman Brack.*

CAYMAN BANK.—A bank was discovered in July, 1839, having on it from 17 to 15 fathoms water. *Cayman Bank.*

It is about 4½ miles long, in an E.N.E. and 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.

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. *Pickle Bank.*

THE ISLAND OF PORTO RICO.

This island is 30 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 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. 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 3 miles, and along the South coast at 5 ; 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.

On the Morro there is a light, 174 feet above the sea. It is a revolving-light, showing eight seconds of light every two minutes. *Light.*

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 1½ foot.

High-water.

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 should venture in who is not intimately acquainted with the place.

Passages between St. Thomas' Island and Culebra 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.

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 1½ mile, 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.

CARLIT, or SERPENT'S ISLAND, sometimes called the Great Passage Island, is more than 6 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., 3 miles. To the West of the Southern part of this reef is the harbor of Culebra, which is 2 miles in extent from the entrance. There are 2 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 Carlit, 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, you will see the S.E. 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 4¼ leagues, and is called Pasqua, or S.E. Cape. You may run down until you come abreast of that cape, within 3 or 4 miles of it, and then steer West; and by the time you have run 3 leagues down past the cape, and it bears N. E., you will see a large breach, or shoal, 2 or 3 miles in length, which lies 3 or 4 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 weatherward 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 beach S. by E. This place is called Guayamo, or Yamma Bay, which may by known by a windmill on a hill, one mile to the Westward of the anchorage, and is much frequented, though there is no shelter from the effects of the 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 inshore. 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 Guayama 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 2 to 3 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 beach. The guard-house is 3 or 4 miles from this key, and may be seen before you get within. You may run in boldly for 2 miles towards the guard-house, and anchor within a mile of the same, in 4 or 5 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 3 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 a 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., 1½ mile 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.

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 the 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, on 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.

PONCE.—The town and harbor of Ponce, lie about 5 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 cocoanut-trees; but the houses are also low, so 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 port 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 2 cables' length, and keep nearest the shore on the Southern side of the harbor.

In proceeding on a West course towards Cape Roxo, that cape, when first seen, appears low, gray, 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.

Guanico.

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 the 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.

Mayaguez. MAYAGUEZ.—The best leading-mark in, is a hill, about 10 miles inland, with a double summit called Montoso, in range with the custom-house, (which has one steeple,) bearing E. by S. ¼ S.

In beating in, stand to the N. until the custom-house and church (which has two steeples) come in range, sounding for the Manchas, and to S. tack, before Montoso ranges with the church, until you have over 5 fathoms inside the bar: when the land S. of Guanagiva shuts in behind it you are inside all the reefs South of Algarroba.

The Manchas extend about 3 miles W.N. Westerly from Algarroba Point: the soundings upon them are very irregular; the least water found was 2½ fathoms; the bottom shows very plain, the brown spots being generally shoalest: they break sometimes in rough weather. There is a good channel inside from Anasco Bay, giving Algarroba Reef a small berth, and taking care not to haul round it until Montoso opens to the South of a white sugar-house chimney, (Vico's,) which stands conspicuously near the shore, N. of Puntilla.

Algarroba Reef is nearly bare, and is bold to the South-westward. Vigo's white chimney on with Montoso, is the mark for it. They intend to erect a light-house on the point.

The Puntilla Reefs are nearly dry, and bold to the South-westward.

The church and Montoso in range, lead into 12 feet water on the bar.

Montoso shut in with a hill South of the church, having a remarkable red road upon the side of it, is the range for Piedra Blanca, which has only 8 feet water in one spot.

The Rodriguez Reef is dry in several spots, and always shows itself. There is a passage through the midst of it, about N.E. by E.; least depth 12 feet, green water. To the N. and N.N.W., for nearly 2 miles, the soundings are irregular, and there are probably spots having less water than what is marked.

Zacheo Island is 22 miles N. 50° W. (true) from Guanagiva, and 2½ miles N. 62° W. from Algarroba.

Lat. of custom-house, N.				18° 13′ 00″
Long. of	do.	(by French survey)	W. from Greenwich	-67 12 45
Do.	do.	(English charts)	W. do.	-67 08 00

Tides. Tides rise and fall 2 to 4 feet; time irregular.

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 highland 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, (Whiteston's Point,) the North point of Aguada Bay.

AGUADILLA BAY, called Aguada on some charts.—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″. *Aguadilla Bay.*

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 3 cables' length from the shore, in order to avoid 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 4 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 3 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 2 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.

"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 Bruguen, 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 the town, lying on the N.E. side of the bay, with straggling houses to the S.W. for 2 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 anywhere, 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 further inshore, in from 10 to 15 fathoms. If you moor, lay your anchor in 10 fathoms, and outer one 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. Inshore 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 further 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 lie 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., 3½ 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 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 Guanagiva; the distance between them being about 4 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 2 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 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 North and South. 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. San 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.

"South from Punta de Guanagiva, 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 Faudaco, ends at Puxto de Veras.

"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 2½ miles, or a little more; and nearly West from this point, at about 6½ 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 Atayaya 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 does not alter the appearance of its shape, even when you are to the Southward of the isle Desecheo."

Shoals off the West Coast.

SHOALS OFF THE WEST COAST.—Besides the shoals on this coast already noticed, there are several others, which we shall now describe:

"Baxo Negro (Black Shoal) is a reef of very small extent, and upon it the sea always breaks. It is distant from the nearest coast about 3½ miles, and lies W.S.W. ½ W. from Punta Guanagiva, and S. ¾ E. from Punta de Guiguera.

"Media Luna (Half-moon) is a reef of about two-thirds of a mile in length, North and South, and about 2½ cables in breadth. 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 Guanagiva, and South from Punta de Guiguera.

"Las Coronas (the Crowns) are shoals of sand, on which at times the sea breaks, and its extent in all directions is scarcely a mile. It is about 3½ miles distant from the coast, and bears nearly S.W. by S. from Punta de Guanagiva, S. ½ E. from Punta de Guiguera.

"A shoal lies to the Westward from Punta de Guaniguilla, at the distance of 2 miles. It may be about 2 cables' length in extent, and there are 3 fathoms of water upon it; the bottom is rocky. It bears S. by W. ¾ W. from the Punta de Guanagiva, and S. ¾ E. from Punta de Guiguera.

"Baxo de Gallardo is almost due West from Punta de Melones, and 6½ miles distant from it. Its extent is about 3 cables length, and the least depth of water on it is 3 fathoms, with rocky bottom. It lies in 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.

Directions for making Porto Rico, &c.

By those advancing from the Eastward, and bound to 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 over-run, at the expense of both time and labor. But as it may happen, that some one may be mislead by an erroneous reckoning, and find himself in this predicment, we recommend 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. Bartholemew 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 daylight, 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. Bartholemew 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 Antillas, or Carribee 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 making and navigating among the Carribee Islands.

[From the Derrotero de las Antillas.]

As to choosing the North or South part of any of these isles for making your landfall, 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. Bartholemew's at less than 4 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 mountains 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 at 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 further distant from it than from St. Bartholomew's.

When there are any clouds that hinder St. Martin's from being seen, there may be some hesitation in recognizing 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.

When you are 6 leagues to the Eastward of 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 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 2 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 exists between Trinidad and the Gulf of Maracaybo.

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, Norman'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 nearly 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 Spanish-town 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, where you may anchor safely in from 5 to 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 to 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 middle one 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.

Under the lee of Virgin Gorda, the ground is so clear that 300 sail may anchor in the space between the Dogs and the Valley. The North Sound is a perfectly secure port, and of great capacity. The entrance between the two reefs is not difficult to discover.

Anegada, or Anagada.

ANEGADA, or ANAGADA, is the most Northern of the Virgin Islands, and 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.

Many 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 further 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 further to the Westward.

Fallen City, or Old Jerusalem.

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.

TORTOLA.—To run through Sir Francis Drake's, or the King's Channel, between the Round Rock and Ginger Island, towards Tortola, as 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 6 or 7 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 3 or 4 leagues of Round Rock you will raise the low keys called the Broken City, or Old Jerusalem, which extend from the S.W. end of Virgin Gorda, in a S.S.W. direction, to within 2 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 2 or 3 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. 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 hand-line) are found abreast of the East end of Ginger Island 15, 13, and 12 fathoms; the course from W. to W. by S.; which soundings continue 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 Norman's Island, and bearing S.W. by S. 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 neared the shore, having the point N.N.W., but again found that it suddenly shoaled to 4 fathoms, then at 3 cable's 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 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, the battery bearing N.E., but the mark for letting go the anchor is the flagstaff 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 merchants' anchorage is in from 10 to 13 fathoms, on the Western side.

In proceeding outward, from Tortola, you sail through the Southern channel, between the West end of Norman's Island and the East side of Flanagan, or between the latter and the East end of St. John's Island.

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 experienced masters usually anchor under Peter's or Norman's Islands, both of which have good bays."

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 horrizon 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 until her rising. The rate varies, according to the breadth of the channels, from 2 to 5½ knots, and the rise is from 20 to 40 inches. *Current, &c.*

ISLAND OF ST. JOHN.—This island is 2 leagues broad and 4 in length, and 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, 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. *Island of St. John.*

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 7 or 8 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 ships 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, 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., 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., 5½ leagues; from the North side of Santa Cruz, N.N.W. ½ N., 10 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 dépôt of rich merchandise; it has a regular careening place, and is defended by a fort and several batteries. *Island of St. Thomas.*

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 until 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 continue your N.W. course about 2 or 3 miles until 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.

The channel between the main island and Buck Island is but 1½ mile broad, and at the entrance, in the fairway, 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 Muhlenfeldt'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 on which are 6 feet water, E.N.E., upwards of 15 fathoms to 5½ feet—in the centre 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.

Light. *Entrance of the Harbor of St. Thomas.*—There is a fixed light on Muhlenfeldt's battery, at the East side of the entrance of the port of St. Thomas, lat. 18° 19′ 22″, long. 64° 55′ 8″. The elevation of this light is 95 feet above the level of the sea, and is visible at the distance of 5 leagues. The light is red, in the S.E., S., and S.W., and can thus be distinguished from those of the city and neighborhood.

To avoid the hidden rocks, called the Triangles, lying outside to the Eastward.—To clear these rocks in passing to the Westward, the Eastern angle of the light must be brought to bear N. by W. ½ W., in a line with the S.W. corner of an out-building, painted white, and (standing to the Northward) this range carries you within a cable's length of the Triangles, and is the least distance at which it will bring you; and the more you keep the building covered by the light-house, the greater will be your distance from these rocks. The outbuilding is about 65 feet to the Northward of the light-house, and will be lighted during the night, and visible in clear weather.

Prince Rupert's Rock, which is nearly in the middle of the entrance of the harbor, will be always white-washed, and visible at night.

Scorpion Rocks lie about midway between Muhlenfeldt's Point and Cowell Point, and have on them 20 feet at low-water. You are on them when Frederick Point is in range with the house on French Hill, (Western part of the town,) and Cowell Point in one with the South point of Sandy Bay, on Water Island.

Kiaer Rock has on its shoalest part 17½ feet. The marks for it are, Contant House in one with the N.E. end of Gallows Hill, and the Castle Telegraph in one with Kiaer Tower.

From St. Thomas' Harbor, if bound to Porto Rico, being in the offing, steer W. by N. until 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 2 or 3 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 may be seen 5 or 6 leagues off.

Remarks on the passages in general, from the "Derrotero de las Antillas."

The straits between the Dog's 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 Norman's islands; and that between Norman'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 does not pass 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, as it diminishes the vessel's way, and increases her lee-way.

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.

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 which run for the Southward of the Virgins from 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 Norman'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 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 further in, and lie as if in a dock; but it is necessary to furl your sails 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 Norman's Islands, there is a rock of small extent, which has not more than 9 feet water on it. 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.

ST. CROIX, or SANTA CRUZ, is the Southernmost of the Virgin Islands, and lies W. by N. from Sandy Point, in St. Kitt's, 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 scantly watered; and wood 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 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.

Christianstæd is situated at the bottom of a bay on the North coast, under the cannon of a fortress, which defends the principal harbor. The other town, named Frederickstæd, 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 6 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 Loot's Key, an inlet

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 aagles.

To enter the port of Christianstæd much practice is required, and therefore a pilot must be taken.

FREDERICKSTÆD.—The roadstead of Frederickstæd, or as it is called the West End, is free from rocks or shoal places. The ground shelves gradually off, with clean bottom of white sand, with here and there a patch of dark color. It is not very good holding-ground, and you want both anchors down. The wind most generally comes off the land, which is the trade-wind, but occasionally, say once in two or three years, during the hurricane season, the wind for a few hours will blow from the West right on the land, when the only safety is to up anchor and put to sea.

Vessels drawing 12 feet can anchor two stone throws from the beach, in front of the fort or custom-house, and vessels drawing 15 to 18 feet from 300 to 400 yards off. This is well to know, for in coming in you have to make two or three tacks, and wish to get as near as possibe to the landing-place, which is just South of the fort. All goods are landed and loaded by small lighters, that hold about ten hogsheads of sugar, from stages or small wharves of wood that project some 30 feet into the water. There are three of them. At night there is an ordinary sized glass lantern South of the fort. There is more commerce at this place than at Christianstæd, the other town of the island.

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. From the East point of Goat Island a reef extends 1¼ mile 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.

The Eastern point of St. Croix is in lat. 17° 45′ 30″ N. lon. 64° 34′ W.

The Eastern point of Buck Island, lat. 17° 47′ 18″ N., lon. 64° 36′ 40″ W.

A. Lang's observatory, (elevation 400 feet,) lat. 17° 44′ 32″ N., lon. 64° 41′ W.

Full 9 nautical miles N.E. by E. ½ E. from the East end of St. Croix, and about 11 nautical miles E. by N. from the E. point of Buck Island, commences the Eastern extremity of an extensive bank or shoal, the Northern limits of which round off thence to the N.W., soon afterwards stretch Westerly, inclining at last to the Southward of a Westerly direction, towards Buck Island Eastern shoals, with which it may be considered as connected. The Northern edge of this shoal is a narrow coral ledge, of several miles in length, on which 5½ fathoms of water is the least depth yet found; the more common depth being 6, 6½ and 7 fathoms.

Along the whole line of the Northern edge, and to the very Eastern extremity of the bank, where there are not less than 7 fathoms water, the sea breaks in an awful manner, during severe gales of wind, and sometimes, also, in moderate weather during the great Northerly ground-swell, which occasionally sets in during the winter months.

A line of direction, drawn from the observatory E. 24° 15′ 30″ N., passes through the shortest part of the Northern edge of this coral ledge, through its whole length, until it approaches the Eastern limits of the shoal, where it rounds off to the S.E. and S. as far as the bearing E., 15° 50′ N., from the observatory. Its most Eastern part bears from the observatory E. 17° 20′ N., which will place it in lat. 17° 49′ 25″ N., lon. 64° 24′ 40″ W. from Greenwich, having there 7½ fathoms, which, in coming from the Eastward, you at once strike from an ocean depth. At this spot the East end of St. Croix is distant 9¾ nautical miles. In approaching the Northern edge of the shoal from the Northward, you at once get from an ocean depth upon its shoalest part, passing which, and standing to the South, the water gradually deepens, on a clean sand bottom, during the short time taken in crossing the bank when standing in this direction.

The bank is the resort of many whales during spring and summer.

Island of Sombrero.

ISLAND OF SOMBRERO.—Between the Virgin Islands and that of Anguilla, lies a small rocky island, about 2 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 further off than 5 or 6 leagues at most.

This 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.

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 2 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 further 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 further 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 further off than 4 or 5 leagues.

Remarks 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. Kitt's 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 bore W.N.W. *Bearings.*

"The direct course from the West end of St. Kitt's 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 part 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. Bartholemew 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 N. 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 4 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 further out than 2 cables' length, and at less than a mile there are 24 fathoms, 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, sand and gravel; and near both coasts it does not decrease 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.

St. Martin's. 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 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 everywhere about the island, especially with a N.E. wind. Wood is scarce and dear.

The principal town, Phillipsburgh, 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 Phillipsburgh 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. Peter's, 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 further 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 Phillipsburgh Bay, on with the high point of the Westernmost mountain in St. Martin's; and on the opposite direction, by bringing the flagstaff 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 Port Amsterdam. At a third of a cable's length around this rock, or shoal, 6, 7, and 8 fathoms, 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 2 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. Bartholomews. 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 5 or 6 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 9 or 10 leagues off. E. ¼ N., 14 leagues distant from

e island, lies a large bed of rocks, about 20 yards square. On the West side of is a swell. The rock is sharp-pointed, and sometimes covered. When the sea falls, is about 4 feet dry.

Vessels bound for this island from the Eastward, should endeavor to run down the outh side, and keep as near the shore as possible. There are several rocks on the outh side, but all above water, and bold to, the largest of which is a long flat key, lled 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 hen abreast of the first battery, lay off and on, and wait for the pilot. A stranger ould not enter the harbor without a pilot, as the channels are narrow, and the winds ten baffling.

There are three channels by which vessels enter the harbor, according to the winds z.: South, South-west, and North-west channels.

The South Channel has a good depth, but it is dangerous for a stranger to attempt, a rocky reef extends from the middle key, called the Saints, two-thirds across the annel; but should a vessel be compelled to run in without a pilot, keep the main ore close aboard, and anchor when within the second battery, in 4 fathoms. With e wind at East, the South-west channel is the best, and with a N.E. wind the orth-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 lands, but the channels between them are all bold and free from danger with the ind at N.E.

I would recommend to those bound in to run down the North side of the island, uble the West point and stand in for the harbor. The Baleine, or Whale, is a rock 0 fathoms West from the key called the Islets, in front of the harbor, is even with e water, and has a point standing up like the fin of a whale. Vessels can pass all ound, within 10 fathoms of the rock.

On the West side of the island is the town of Gustavia, pleasantly situated at the ot of a hill, forming three different sections, and in the centre is the careenage, with harves all around. On the South-west side of the water are several ship-wharves, th conveniences for careening, caulking, and carpenters' work well executed, and a moderate expense. The careenage can contain 60 sail, and the road from 300 to 0 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 is then high-water at 10h. and 30m. P.M., while the sun is furthest to the North of e equator, but comes about two hours sooner in the following months, until the sun ts furthest to the South, when it is high-water at 10h. 30., A.M., and it runs afterrds in the same proportion back again. The winds which are of long continuance metimes make a trifling difference. The horizon is also lowest at the time when e sun is furthest to the North of the line; and so to the contrary. The greatest ference in the ebbing and flowing is 18 inches; but, in general, only 10 inches. *High-water.*

DANGEROUS ROCK.—S. 51° E., 12 miles from the S.E. point of St. Bartholow's, lies a dangerous rock, nearly even with the water's edge. *Dangerous rock.*

SABA.—The island called Saba belongs to the Dutch. It is very high, and its pres bluff and clean. On the S.W. part is a small town built in a plain, but hid m the sea by very high hills, except to the Southward. A very high mountain contutes the centre of the island. The island appears like a steep rock, of a round m; it is about 9 miles in circumference, accessible only on the South side, on which re is an intricate and artificial path leading to the summit, which admits only one n at a time. *Saba.*

t is said that the bottom may be seen all round. On the N.W. side there is a rock, led the Diamond, standing at about a musket-shot from the shore, and which aprs afar off like a sail. There is an extensive bank of soundings, extending 7 gues to the Southward and S.S.W. of the island, having on it within that distance m 12 to 17 fathoms. Beyond these soundings, to the South, no bottom is to be nd. At 4 miles to the Southward of the island there is a shoal spot of 3 or 4 homs, on which the sea breaks, during gales of wind, but the exact spot has not n ascertained.

THE ISLAND OF ST. EUSTATIUS makes, at a distance, like a steep rock, ing out of the sea, and in a sugar-loaf form, ascending upwards in a round hill, but, a nearer approach, its figure changes, and it appears longer. The rock is composed two mountains, whose middle land is pretty even. The Eastern mountain is much her than that to the N.W.; it is hollow in the middle, the excavation being the ter of an exhausted volcano, which has probably constituted the island; the bota is pretty nearly on a level with the town, and is frequented by sportsmen in purt of game. *The Island of St. Eustatius.*

The town stands on the South side, and is divided into two parts, called the Upper 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 ascend by means of steps cut in the rock. The lower town consists of a single street, and is very indifferently built.

Light. There is a revolving light on the centre of the island in the upper town: time of revolution, one minute.

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 further 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 the 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, 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. Kitt's. NEVIS AND ST. KITT'S are high, and their eminences may be descried at the distance of 18 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 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 si es 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 must also be carefully avoided.

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 2 leagues from the shore. It is added that an English ship of the line also touched upon a rock nearly 2 miles S.S.E. from Nevis. This may probably be the same.

The narrows, or straits, between St. Kitt's 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's 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. Kitt's; for on the Southern side there are several shoals.

An extensive shoal, from a mile to a mile and a half in breadth, and 5 miles long from N.W. to S.E., lies without the Eastern end of the Narrows. The passages are, therefore, between its North end and St. Kitt's, 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 8 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 port side, keeping over towards the shore of St. Kitt's. 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 port side, keeping over to the shore of St. Kitt's, 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. Kitt's N. ½ E.; distance off-shore about one mile.

On the beach at Bassaterre there is a fixed red light, 37 feet above the sea. *Light-house.*

In running from Nevis to Bassaterre, 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. Kitt's, two miles.

ST. CHRISTOPHER'S, or ST. KITT'S.—The centre of this island is occupied by a great number of high and barren mountains, intersected by rocky precipices, almost impassable, and among which there are several hot springs. Mount Misery, which is an exhausted volcano, 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 2 leagues distance, appears like several detached islands. The N.W. part is the highest, but declines gradually to the sea. *St. Christopher's, or St. Kitt's.*

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.

The principal town is that of Bassaterre, on the South coast, situate at the mouth of a river, which opens into a bay called Bassaterre 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. KITT'S.—In sailing off the Southern coast of St. Kitt's, the following lands are to be particularly noticed, namely, the Nag's Head, or South end of St. Kitt's, on which there is a high hummock; the high-lands on each side of Frigate Bay, the bay at the North end of the isthmus which connects the Northern and Southern parts of St. Kitt's; Monkey Hill, a high mountain to the Northward of the town of Bassaterre; and Brimstone Hill, another high mountain, with a square fort on it, to the Eastward of Sandy Point Town in the West. *Southern side of St. Kitt's.*

In proceeding from the Southern side of Nevis towards Bassaterre, 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 2 miles S.S.W., Westerly, from the Nag's Head, above mentioned. Advancing towards Bassaterre, 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 of 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 Bassaterre 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 Bassaterre, have been made by Mr. Backhouse: "In sailing past the island of Nevis from Bassaterre Bay, give the S.W. point a berth of 1½ mile, 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 5½ miles to the Westward of Bassaterre. 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 midway 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 flagstaff 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 gully, and floated off to the boat. There is a great surf on the rocky shore.

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 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 Bassaterre Road and Old Road.

In Bassaterre, which is a large open bay, the marks of the anchorage are as follow: The long point of Nevis S.S.E., Nag's Head S.E., Bluff Point W. ½ N., the town of Bassaterre North, distance off shore half a mile, depth of water 7 fathoms; wood purchased, water better and easier got at Old Road, about 1½ league from hence; tides none.

In the 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 gully; then float them off to the boat. A great surf and a rocky shore.

Barbuda. BARBUDA.—The greatest extent of Barbuda, from S.E. to N.W., is 15 miles. Its highest land cannot be discerned at more than 6 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 bow; 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.

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, 4 miles above Palmetto, on the S.W. point. There is also anchorage off the S.W. coast, in 5½ fathoms, sandy bottom, with Palmetto point N.W. by W., 3 miles, and Cocoa Point, the South point of the Island, E. by S., 4 miles distant.

Antigua. 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 circumstance 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. 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 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. 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 near the port 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 highland. *English Harbor.*

Three fixed lights on a staff are shown on Fort Berkeley when the mail-steamers are expected. The upper light is red; the others of the natural color. *Lights.*

The lights are in lat. 17° N., long. 61° 45′ 42″ W.

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 Berkeley, 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 storehouses on the Western side, in 3, 4, and 5 fathoms. The water is generally smooth. It is not safe for a stranger to enter, 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 1½ mile 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 towards 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. *Falmouth Harbor.*

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, from a cluster of five remarkable small 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 inshore, 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 2 cables, so as to avoid a reef which stretches from its Southern side to the S.W. Be careful not to stand above 3 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 *Road of St. John's.*

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 flagstaff 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 further to windward 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 flagstaff 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.

NORTHERN SIDE OF THE ISLAND.—The Northern and Western coasts of Antigua are environed by numerous reefs, 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.

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, 2 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.

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, 1¼ mile 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 windmill: 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 chan

nel 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 water lies S.W. by W., at the distance of nearly 1½ mile 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.

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 flagstaff 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 dock-yard and careening-place for vessels of any size. The strait 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, having for more than 2 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.

English Harbor. *Falmouth.* *Carlisle Bay.*

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.

Five Islands.

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 2 miles from 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 2 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 Carbizon'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 2 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 2 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 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 5 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 4 miles, until Sand 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.

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, 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.

Lights.

Two fixed lights are shown on the beach at Plymouth, on the expected arrival of the mail steamers.

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 15 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 South-easts, 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 3 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 hay-rock, and 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. *Redondo.*

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 3 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 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. *Aves, or Birds' Island.*

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 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 who 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 further off than 6 or 8 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.

GUADALOUPE.—The form of Guadaloupe is very irregular, 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 500 tons, whilst in others there is scarcely water enough for a bark of 50. The length of this strait is about 2 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. *Guadaloupe.*

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 Soufrière, or the Sulphur Hill, which is about 5,500 feet above the level of the sea. This mountain exhales a thick black smoke, mixed with sparks, visible in the night.

Its principal town, Port au Petre, or St. Louis, is a place of considerable trade.

The chief town of Guadaloupe is that named Bassaterre, situated on the West side, near the South end of the island.

Lying at anchor at Bassaterre Road, you have 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 bearing N.W., Northerly, and the Westernmost part of Bassaterre Bay N.W. by N., distant one mile.

There is also good anchorage in this road in 7 fathoms, sandy ground, with the small anchor in 37 fathoms, similar ground, on 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 Bassaterre 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 highlands. Off the N.W. point of Guadaloupe there is a small but remarkable high rock, called Tête à la Anglais, 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.]

Grande Terre.

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 GRANDE TERRE, and the Western part is subdivided into two by the mountains; the East being named Cabes Terre and the West Bassaterre. The capital of this island is St. Louis, or Point à Petre on the Western part of Grande 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 for 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. of Point Bassaterre 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 2 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 Bassaterre you may approach as near to the West coast as you choose, as 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 à Petre, you ought to approach within 2 miles of the South coast, or Grande 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 à 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 2 miles of the coast, are 6 or 8 fathoms of water.

If bound to Port Royal or Bassaterre, direct your course 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 Petite 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 2 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 further off the coast, it is no uncommon thing to be 4 or 5 days absolutely becalmed. Any one who is not able to get near the land of Guadaloupe, that is, within the distance of 2 miles, must positively pass at 7 or 8 leagues from it to avoid the calms.

Light house.

There is a fixed light, 108 feet above the sea, 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° 04′ 51″, 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.

Petite Terre

PETITE TERRE is a small sandy island divided into two parts by a shallow channel. It lies directly in the fairway, or in a line between the Eastern coast of Marie-Galante and the Isle Desirade. There is pretty good anchorage by Petite Terre, to the Westward, at 2 miles from shore, in 7 fathoms water.

POINT PETRE.—Point Chateau, 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 miles of the shore, until you pass an island called Le Grosier, which is the first land 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 the 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. *Point Petre.*

There are 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 Marie-Galante, Desirade, &c.,*

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 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. 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 W., 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 Basaterre, which is protected by a fort, stands on the S.W. point of the island. *Marie-Galante.*

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. *Desirade, or Deseada.*

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 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.

Moal Guadalupe. MOAL GUADALUPE.—This port, which is often visited by vessels from the United States, and also from other ports, is W.N.W., 11 miles from Point Chateaux, and 18 miles W. from the North-east end of the Island of Deseada. The entrance to it is between two reefs, which protect it; but when the sea is heavy, which is often the case, it breaks entirely across the channel, which prevents vessels from passing in or out, and causes such a sea in the harbor that it is difficult to land or take in cargo.

When once in, you moor head and stern with your bower chains to anchors secured in the rocks on each side of the harbor. With the wind from S.E. by E., and to the Southward of it, vessels cannot enter; and when it blows from N.E. by E., and to the Northward of it, they cannot leave this place. It is not uncommon for vessels to wait from six to twelve days for a chance to get in, and a like time for an opportunity to get out after they are ready for sea. Vessels drawing over 13 feet of water should not visit this place. The hire of a launch is from twenty to twenty-five francs per day, and should you damage one, which is sometimes the case, will have a pretty round sum to pay for the repairs of it. Sand ballast can be had for the trouble of taking it from the beach. Stone ballast costs $1 per ton, put on board. Water costs $1 per 100 gallons.

The town contains about 4000 inhabitants, and is 18 miles from Point à Petre, over a good road, and through a well-cultivated part of the island.

Dominica. 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. 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, a very bad ground. The anchoring-mark is to bring the fort N.E.

Between 3 and 4 miles from the North end lies a noble bay, called Prince Rupert's Bay, 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.

Scott's Head, or Point Cachacrou, the South point of Dominica, is a high rock, having a flagstaff on it, and from a distance appears like an island.

The town of Roseau, is about 6 miles to the Northward of Scott'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. *Light.* A light is usually shown from the flagstaff on Fort Young.

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. BARBADOES TO DOMINICA, &c.—If you are bound to Dominica from Barbadoes, you must steer N.N.W. until 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, (Cape Melville,) you will see a round bluff making like an island (Prince Rupert's Head) 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.

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 appear 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 it 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 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 further out, in from 12 to 20 fathoms, fine dark sandy bottom, at from 1 to 3 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 current sets to the N.W., but they are of little importance.

ST. ESPRIT REEF, reported in lat. 14° 37′ N., long. 58° 59′ W., does not exist. *St. Esprit Reef.*

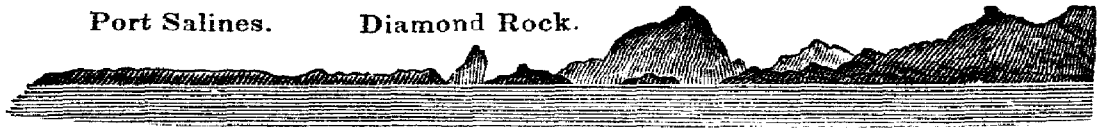
MARTINIQUE is about 12 leagues in length, and lies N.W. by N., and S.E. by S. Its breadth is extremely unequal, and scarcely anywhere more than 4 or 5 leagues; and if you include the promontories, which project in many places 1 or 2 leagues beyond the rest of the island, its circumference will include above 30 leagues. The land is very uneven, and everywhere 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. *Martinique.*

The principal towns are those named St. Pierre (St. Peter) and Port 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 Fort 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. 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 accidents to which we might otherwise be exposed. We shall 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 2 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 incloses a multitude of banks of gravel and coral, which encumber it, and greatly diminish 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 4,000, without including the garrison of Fort Bourbon, is built on a low flat piece of ground, formed probably by the alluvial deposites 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. At its Eastern extremity, near the careening-place, there is a fine parade called the Savanna, which forms the glacis of Fort St. Louis, elevated, like the rest of the ground, only 3 or 4 feet above the surface of the sea.

Lights. Fort St. Louis (on which there are two fixed horizontal lights, 131 feet above the sea) 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 accssible from the land, except by a narrow isthmus, which joins it to the savanna. 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.

Light. On the fort on Point Negro there is a red light elevated upon a red mast.

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. Further 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 gray sand, which is terminated by a handsome beach, where you can land with great facility at all times.

The anchorage extends Westerly as far as the Virgin Banks, 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 flagstaff 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 flagstaff of Fort St. Louis bears N. 51° 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, as they will cut your cable. 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 flagstaff of the fort, and nearly S ¼ W. of Madame River, in from 90 to 110 feet water, that government vessels usually anchor. Merchant vessels usually approach nearer the fort and the savanna.

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 3 cable's 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 cable 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 water. This bank is situated $1\frac{7}{10}$ mile 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 careening, 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 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 4 cables' length South of Fort St. Louis, and on the other side 3 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 1½ 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 further South, we meet with banks reaching almost to Great Islet.

A bank of gravel and madreporic rocks, covered with but 2 to 3 feet of water, surrounds almost entirely the Western part of Great Islet, and extends to within 5½ 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 Ramieres, a rock elevated 25 yards above the sea. It is separated from the coast by a channel about 1½ cable'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 Fort 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 Ramieres, 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 N., 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 windmill, which is one of the most remarkable objects in the neighborhood of Trinity. The Carvel Peninsula extends in a direction E. 27° N., near 6 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 everywhere, leave only a narrow pass practicable for boats. *Tartan Bay.*

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 a in 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 exists, 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 from 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 3 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 passage between the Loup Ministre, the Loup St. Mary, and the Islet of St. Aubin, is at least a mile wide, and is 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 for 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 6 or 7 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 passing by the sight of the reefs which line at 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 2 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 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. There is no remarkable edifice. 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. Good water may be had from a spring at the plantation of Beau Sejour.

Fort Royal to St. Pierre. FORT ROYAL to ST. PIERRE.—The N.W. point of the Fort 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 its Westernmost houses to abreast of a battery East of it. The anchoring-ground, or bank, reaches only to the distance

a cable's length and a half from the shore. Within half a cable's length of the each the water is shoal, deepening thence to 3 fathoms on the outer part, and to 5, 10, 15, 18, and 25 fathoms, at a cable's length distance: off the battery the ground clean, softening to soft mud abreast of the Westernmost houses. Without the pth 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 f the valley behind them; then steer in with this mark. When the point between ase des Navires and the next village, called Case Pilote, opens without the land to e N.W., you will be entering on the bank in 43 fathoms; then steer so as to ave the Westernmost house of the cluster above mentioned on with the middle f the valley; and with Le Grosse Pointe, on the South side of Port Royal Harbor, hut in behind Point Negro, you may anchor a large ship in 18 or 20 fathoms. mall vessels may stand further in, with the same mark, to the depth of 9 or 7 thoms.

ST. PIERRE, (St. Peter,) the trading-town of Martinque, lies about 4 leagues to e N.W. of Fort Royal. It is built partly upon the rising grounds at the foot of a dge of hills, and partly along the shore of a spacious circular bay, which forms an pen road to the Southward and Westward. *St. Pierre.*

The best anchoring-place, called the Frigate's Anchorage, lies in the Southernost 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. ¾ E., and Point Carbet (on the South side of the road) South, you will have 7 fathoms, oozy ground.

Lying moored in this road, with one anchor in 25 fathoms, fine sand, and the other n 4½ fathoms, same ground, the following bearings by compass were taken—the variation 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 Negro's 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 nchor close to the shore, to the S.E. or E.N.E., (or even on shore,) and the other to he N.W.

In the hurricane months, that is, from the 15th of July to the 15th of October, ships annot lie with safety in this road, and the French ships are generally obliged to leave t on the 15th of July at furthest. If they are to remain for a longer time at Martinique they retire into Fort Royal Bay, where they lie secure against the hurricanes; hey may also find shelter in Trinity Bay to the windward, and on the North side of he island.

Mr. Backhouse, in his description of the Road of St Pierre, observes:—"there are 30 and 40 fathoms at 2 cables' length from the shore; but further 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. ¼ W., distant 5½ 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 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 these 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 ground-swell is much nearer and less dangerous; the only inconvenience it occasions is to impede considerably the communications to 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, 2 cables' length from the shore, but you must not anchor further 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 are 150 to 180 feet of 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 from the shore, is a bottom of rock called Hospital Key, 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 further 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 further 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.

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 Carvælle, 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 Mount 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 5 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 Fort 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.

emarks 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 . Its Eastern part is full of bays, but they afford little shelter, and are frequented coasters only. From the South Point, or Point Salines, along the Western coast, 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. hat of St. Pierre is an open roadstead, which affords shelter from the general breezes ly: and vessels that are obliged to remain in Martinique during the hurricane season, go to Fort Royal to pass it over. The fortress, called Fort Royal, is on a tongue land, which runs nearly half a mile to the South into the sea; from the S.W. part this tongue, a shoal of sand and rock stretches out, but it may easily be discovered the color of the water. By the Eastern side of this point is the harbor and arsenal, here vessels anchor in the greatest safety; but they enter into it only in the season hurricanes, or for the purpose of careening; its bottom is excellent, with a depth from 6 to 10 fathoms. The city is about one-fourth of a mile to the North of this oint, and at the seaside on the West part, in Flamingo Bay, which is, therefore, the nchorage for merchant-vessels; and indeed, generally, for all vessels which are not remain long at Martinique.

If you approach Martinique on the North side, and mean to anchor in the road of St. ierre, you may haul in as close as you choose for Macouba Point, and should run long the coast afterwards so as to pass the outside of the Islets du Seron, which lie the N.W. point of the island; and from these you may shave the Pointe du recheur (Preacher's Point) within half a cable's length, in order to run and anchor in ont of the town of St. Pierre, or a little to the South of it; keeping in mind that the past is so steep, that half a cable's length from it you will have 4 or 5 fathoms water, nd 35 or 40 fathoms at 3 cables' length. Vessels moor with two anchors, one to he West in 35 or 40 fathoms, and one to the East in 4 or 5 fathoms; it is, however, etter to have a cable on shore, in place of the anchor to the East, that you may not rag with the strong gusts of wind which come over the land.

If you are bound to Fort Royal, you will steer from Pointe Precheur to Morne aux œufs, which is the South point of the Bay of St. Pierre; and from it you will sweep long the coast to shave Pointe des Nègres, (Negro Point,) from which you must haul wind all you can, in the understanding that, from the said point to Flamingo Bay, ou may shave the coast without any risk.

As it is necessary to beat up from Negro Point to the anchorage, keep in mind that he shoal which runs out from Fort Royal Point, extends to the West as far as the eridian of a brook which runs into the sea, to the Westward of the city; and thus, hen you mark the said brook at North, you must not prolong the South tack further han to bring Fort Royal Point a little to the Northward of East, but ought rather to o about before you bring it to bear East, and anchor on the other tack, opposite the ity. If you have to enter the harbor, it is advisable to take a pilot.

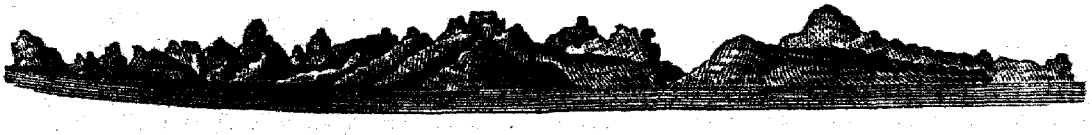
Those approaching Martinique from the Southward, must steer so as to pass close the Diamond Rock and Point, and shave Cape Solomon, where the course is early North, but nothing to the East of it, until Point Noire bears East; from this ituation you will haul by the wind to take Flamingo Bay, or enter into the harbor, as ay be requisite, it being well understood that you can anchor in any part of the Great ay.

If coming from the South, and bound to St. Pierre, you must steer from Solomon's ape to Morne aux Bœufs, hauling in to anchor to the S.W. of the town, as already irected.

It is almost a matter of indifference what part of Martinique you make: only in ase of the wind's being free from the N.E., you may consider it preferable to make he North side.

The strait between St. Lucia and Martinique is clear of all danger; the breeze is lways 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 1½ mile to the West of the Sulphur Hill, on the sea-shore, stand two big 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 3 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, 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 6 yards of them.

Lights. Two lights are shown from Tampion Battery on the expected arrival of the mail-steamers.

Nearly a league to the Southward of the Careenage lies the Grand Cul de Sac, or Grand Bay; and nearly 2 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 2 leagues in 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 until 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. part 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 2 cables' length.

Near Brelotte 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 1½ mile 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 2 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 2 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 rong currents to the W.N.W.; and as Port Castries and the bay of St. Croix are wards the Northern extremity of the island, it is advisable to make the land, when und 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 2 leagues. The channel tween these two islands is very good to come through, if bound from Barbadoes the Salt Tortuga, or the Spanish Main; and there are small trading-vessels which ork up through it. St. Vincent's is about 5 leagues long, and lies nearly N. and S. d E. and W. The North end, which is much higher than the South part, is inbited by about 2,000 natives, or Caribs. On the North end there is a volcano, lled La Soufriere, or Sulphur Hill, near Spanish Point. On the West side of the land, which is bold, are several bays, having all of them fresh-water rivers; and on e S.W. side you have good anchorage, as near or as far off as you please, especially Kingston Bay, where the chief town is situated. But the best bay of the island is alair Bay. When you turn up between St. Vincent's and Bequia, you will will see large bluff of land, and just to the windward of that is Balair Bay, or Calliaqua. he shore is bold on each side. Run in to 19, 20, or 15 fathoms, and anchor. There e two rivers which run into the sea.

The course from Carlisle Bay to the South end of St. Vincent's is W., Northerly, leagues. If you intend to anchor in Kingston Bay, you will see a small highaked island, called Young's Island; pass the bay to leeward of this island, and go und a long sloping point; you may go within pistol-shot, but if the wind takes you ort, you may anchor in 35 fathoms, and warp in. There is a small ledge of rocks ose on the weather shore, within 6 fathoms.

Kingston Bay is completely open to the S.W., and is more than a mile in breadth. he town is at the head of the bay, close to the water-side; the anchorage good, e soundings regular, with a bottom of dark sand, apparently clear, and forming a od holding-ground. The water is deep on each side of the bay, and you may round e Eastern head, called the Old Woman's Point, as close as you please, there being fathoms at no more than 200 feet from the shore. The best anchorage for a gate is with the court-house bearing North, in 19 or 20 fathoms, not more than a arter of a mile from the beach. There is a light current setting along the bay, t it is not regular. The tide rises about 4 feet. Fresh water is good, and easily tained. *Tide.*

PRINCESS, or BARAWALLY BAY.—This little bay lies 5½ miles to the orth-westward of Kingston, and its North side is formed by rocks, called the Bottle d Glass, between which and the main there is a passage for boats. There is no nger in going in; and, in coming from the Northward, you may haul close round e Bottle and Glass. When round this point, luff up as much as possible, and you ll open the town barracks, bearing N.E. by E. ½ E., which may be kept thus until e Bottle and Glass Point bears N.W.; you will then be in about 22 fathoms, with ndy ground. *Princess, or Barawally Bay.*

All along the Bottle and Glass side is rocky, but the bottom of the bay all sandy d good ground. If you moor in and out, which is used for ships-of-war, you may arp in, and lay your inner anchor in 12 or 13 fathoms of water, and your outer anhor will be in 32 fathoms. Moor a cable each way.

THE GRENADINES, or GRANADILLOS.—The Grenadines form a chain of numerable rocks and barren spots, which extend N.E. by N., for about 16 or 18 agues. Some, however, are of considerable size and value, particularly Cariuacou d Bequia, both inhabited, and producing good coffee and cotton. Cariuacou lies out 6 leagues N. by E. ½ E. from the N.W. of Grenada. It is of a circular form, about 6 miles in length and breadth, and has a commodious harbor. *The Grenadines, or Granadillos.*

Bequia, called also Little Martinique, is the Northernmost of the Grenadines, d 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 ther with plenty of fish, but no water. The little islands to the Southward of Bequ are very fair, and near them you may stand boldly, having neither rocks nor danger to fear.

A N. by E. course from Point Laurent, or the N.W. point of Grenada, will carr you clear along the Grenadines.

Observe that towards the South part it is rather dangerous to come near in th night.

Island of Grenada. ISLAND OF GRENADA.—There is good anchoring-ground along the coasts, an on the Eastern and Western sides are several small bays and creeks, commodious fo vessels, as well as for the landing and shipping of goods.

St. George. 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. Thi bay is formed by a point called Molenier's Point, on the North, and Cabrit, or Goa Point, on the South. The distance between these points is 3½ miles. The space be tween 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 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.

Greenville. 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 o 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 everywhere 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 and 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 inshore 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.

On the North side of the island, in the channel between it and Redonda, or Roum 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. ST. GEORGE'S BAY.—When sailing into St. George's Bay from the North ward, 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 make 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 irregular from Molenier's Point—some casts 20, 13, 9, and 12 fathoms; and inshore, 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 o white houses over the town, about half-way up the hill. Keep them open with e North end of the fort, and run directly in, until you see a single tree to the South-ard, upon a little hill, open a good sail's breadth to the Northward of a large tree ose to the shore; you will then be within the bank, and may pass the fort point at istance of half a cable's length, in 4 and 5 fathoms. In the mouth of the harbor ere 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, about a cable's length from the fort, with the two white houses, above men-ned, open to the Southward of the fort: but, if you anchor in the bay off the town, e 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 observ- that after passing Point de Salines, there is a very dangerous coral reef lying be-een that point and Goat Point, with only 2 or 3 feet over it in the shoalest part. is bank lies with the signal-staff of Fort St. George in one with the house that has o little turrets, or pavilions, situated on the top of a hill a little to the Eastward of e redoubts on Hospital Hill. With this mark you will be in a line with the reef, d must give it an offing. The bank is about a mile in length, lying parallel with e shore. Within it there is a narrow channel, through which small craft fre-ently pass.

In running from the Eastward towards Point de Salines, you will see Islet Rameur, very small island, lying rather more than half a mile from the nearest shore, and arly a mile from the point. Give that islet a berth of a mile, and do not attempt to ss within it, as the passage is shoal. To Point de Salines it is sufficient to give a rth of half a mile, as at that distance there are 7 fathoms water. So soon as you ss the point, the bay will be open. You must now carefully avoid the bank above scribed, which you will have passed, when a remarkable house, like a summer-house, on a high point close to the end of the reef, bears S.E. On the bank the sea fre-ently breaks.

To sail into the harbor, you leave the Three-fathom Shoal, as before directed, on e starboard hand, and run in close under the fort, and then warp up. The ground is l clear, and the harbor capable of containing, with the utmost safety, a large fleet ships of the line.

You will generally be obliged to work up into the bay, as it lies open to the West-ard, and the trade-wind blows directly outward. The true entrance of the port is om W.S.W.

GREENVILLE BAY.—This port lies about half-way down the island, on the *Greenville Bay.*
istern side, and all those bound for it must be very cautious, and not go to leeward it; for, if they do, they must pass round Point de Salines, and turn to windward, the other side of the island, as the current sets so strongly to the Southward that, th the prevailing winds, the fastest sailing-vessel cannot lead up. They should ave to a little to windward of the Greenville Rock, which lies to the North-east-ard, (off Telescope Point,) and is round, pretty high, and steep on all sides. Upon ing 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 the shape of liamond. One stands at the head of the bay, and South end of the town, at high-ter mark; the other a little inland, on the side of the road leading over the moun-ns. They bear, when in a line, N. 74° W. By keeping them thus you may run ectly in, under easy sail. Be careful to steer very small, as the channel between e rocks is very narrow, not being a ship's length across. After you are through the rrows, if your ship draws more than 13 feet, you must come to at the mooring chain, d lighten.

This harbor, to those acquainted with it, is safe and commodious, being sheltered m all winds. Yet it is impracticable to a stranger, the lead being no guide; and, you once get too near the rocks, the current sets so strongly that you cannot get again.

Remarks on Grenada.

[From the Derrotero de las Antillas.]

Any part of Grenada may be safely approached to within less than 2 miles. On its estern coast are many bays fit for anchoring in, but the principal is that in which nds the town and harbor of ST. GEORGE, or Fort Royal. This bay is about one *St. George.*
ague from the Salines, or the S.W. point. Between that point and Fort St. George, ere is a rocky shoal and banks of sand, with coral. The rocky shoal is half a mile extent from N.E. to S.W., and its greatest breadth is 2 cables' length. On all its ges 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 3 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 3 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 3 cables' length.

Behind the point on which the fort stands is the harbor, which is only 3 cables' length in depth, and into which vessels go to load and unload, or to be careened. This place is well sheltered as the best harbor can be, and vessels of the greatest burden 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 steer towards 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 2 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, 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.

There is said to be a bank and a 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 1½ mile an hour.

The Island of Barbadoes.

Barbadoes bearing W.N.W., about 6 leagues.

Barbadoes. BARBADOES, which lies out of the line and to windward of the Carribee 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 inclosed by a ledge of rocks, called the Cobblers, from one of the most remarkable among them. They extend about a mile from the 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 Carlisle Bay, upon the S.W. side of the island.

Light. There is a revolving light on the South point of the Island of Barbadoes, 145 feet above the level of the sea, from which it is 200 yards distant, and stands in lat.

3° 2′ 45″ N., and long. 59° 33′ 30″ W. The tower is painted in alternate red and white bands.

From the light Seawell Point bears about N.E. by E. ½ E., and Needham Point W.N.W. ½ W.; and, except from between the opposite bearings, the light is visible in all directions from the deck of a vessel, within the distance of 18 miles.

Vessels approaching the island from the Eastward are recommended not to run down their longitude to the Northward of 12° 55′ N.; and as soon as the light is discovered, to bring it to bear West; steering from thence W. by S., and not passing it at a less distance than 2 miles.

If coming from the North-eastward the light will not be visible until it bears to the Westward of S.W. by W., being concealed by the high land forming Seawell Point; and if kept in sight well open to that point, it will lead clear of the Cobblers. Mariners are advised to give them a wide berth, on account of the prevailing current to the Westward.

When the light is brought to bear N.E., a course may be shaped for Needham Point; but in hauling up in Carlisle Bay, that point should be kept at the distance of a third of a mile.

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 be nearly ascertained. When you approach the island, you may run along within 3 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 until 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 North.

The Needham Point light (Carlisle Bay) will show red to the Southward of West, and as a bright light to the Northward of West. The bright light may be seen in clear weather 8 to 10 miles, and the red one about 3 miles. Vessels approaching from the Southward, after passing the revolving light on the South point of the island (giving the point a berth of at least 2 miles) may haul up W. by N. ½ N. for Carlisle Bay, when they will soon make the red light. Gradually nearing it, (the lead kept going,) as soon as the light shows bright, they may luff into the bay and bring up. Needham Point may be rounded within about a quarter of a mile in 5 fathoms water. Vessels approaching from the Northward, as soon as they see the light on Needham Point, must bring it on an E.S.E. ½ S. bearing, which will clear the Pelican and Kettle-bottom shoals. *Light.*

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 flagstaff on Needham's Point; and the thwart mark is the three flagstaffs 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. *Tide.*

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 lies about three-quarters of a mile off.

Before Speightstown, which lies between 8 and 9 miles to the Northward of Bridgetown, and which is defended by three forts, vessels occasionally ride.

There is a bank lying about 300 miles to the 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 Carribee Islands The land in the Northern part is so high as to be seen, in clear weather, at the distance of 15 leagues. *Tobago.*

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 Carribee 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 4 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 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 Man-of-war Bay.

Port Scarborough Light.

PORT SCARBOROUGH LIGHT is upon Point Bacolet. The light is a bright white one, and is elevated 128 feet above the level of the sea. Vessels approaching Scarborough from the windward, and coursing down the coast, steering S.W., will not discern the light until it bears W. ¼ S.; when it is brought to bear W.N.W., the Minister Rock must be looked out for: it bears E.S.E. from the light, distant half a mile. Continue to steer W.S.W. until the light bears S.W., then steer W.N.W. until the light bears N., then you will have passed the light, and must steer N.W. for the harbor, giving attention to a proper distance from the land. When you are well inside of the light-house, and have lost sight of the light, be guided by the soundings, as the depth decreases gradually. Anchor when you are in from 6 to 6½ fathoms.

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 3 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 from the shore, on that side, about half-way down the bay.

Nearly 2 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.

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 13 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 offshore breeze during the 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 6 to 20 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 150 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 2 miles from shore. If it be calm, the current may set you on this reef. At the distance of 2 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 3½ 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. *Eastern Coast.*

At the distance of 3½ miles to the Southward of Little Tobago is Pedro Point, and rather less than 2 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 1½ league 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 3 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 nearing the shore, 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, 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 flagstaff 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 5½ 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 2½ miles *Sunken rock.*

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 until 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 Sarborough 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 there is a dangerous shoal, 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 2¼ miles, and from Point Columbus, Island of Tobago, S. 67° W., distant 3¼ miles, and upon the ebb-tide there is generally a current of 3 miles an hour, setting about N.W. by W., probably caused by the outlet of the waters of the river Oronooka. In this channel, or strait, the current runs to the Westward at the rate of 2 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.

Chiefly from the Directions and Survey of Captain Columbine.

All the bearings given, whether points or degrees, are true bearings, unless otherwise expressed.

Island of Trinidad.

THE ISLAND OF TRINIDAD is of considerable magnitude, containing, according to computation, 2,012 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 Icacque, 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.

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.

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 a 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 2,947 feet above the surface of the sea, and not 2 miles from the sea-coast; those to the Eastward are estimated from 2,000 to 2,500 feet high, and those to the Westward at less than 2,000.

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 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.

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 further 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 1¾ 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 of 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.—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 3¼ 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 mentioned. About 2 miles Eastward of Paria Islet is Trou Bouille Rio; the shore between being chiefly rocky cliffs with two islets lying near it. Nearly 1¾ mile further, 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., 7¼ 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., 2⅓ 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 (at the S.E. side of the bay, and easily distinguished, being the largest in that neighborhood,) S.S.E. ¼ E.; or further 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 further 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 everywhere 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 dfficult to manage a ship.

High-water. 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 2 hours of the ebb, and sometimes the whole of it, set to the Eastward along the shore.

East Coast of Trinidad. 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 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 of 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 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 2 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 somewhat 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 9¾ 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 1¾ 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 1,000 feet above the level of the sea, and forms a conspicuous mark to know this part of the coast by.

Cocos Bay.

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 Orotoire, 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 Orotoire 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 Orotoire, S.W. ¼ 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.

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 2 or 3 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. 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. 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, (Capt. E. H. Columbine,) 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 at 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. SOUTH COAST OF TRINIDAD.—From Point Galeota to the Point de la Grande Calle, it is 3 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 1½ mile 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 2¼ 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 Icacas, 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 1½ mile 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. POINT ICACOS, or ICACQUE, 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 1½ mile, to Point Corral, and thence North-eastward, 1½ mile, to Point Gallos, which has two or three islets lying off its West side.

West Coast of Trinidad. 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 5¼ miles N. 61° E., the coast between forming a bay of the same name, the N.E. part of which is flat at a considerable 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 2 or 3 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. 59° 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., 1½ mile from Cascaal Point, is the mouth of the little river Coura, and 1¾ 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. On the Jetty at Port d'Espagne there is a fixed light 50 feet above the sea. *Light.*

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 inlet, 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-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. *Gaspar Grande.*

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 anywhere; 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. *Chaguaramus Bay.*

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. *High-water.*

Escondido Harbor. ESCONDIDO HARBOR.—To the Northward of Punta San Carlos, or Escondido, is a little harbor, named Escondido. From this point S.S.E. ½ 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 2½ to 4 fathoms in it.

Diego's Islands. 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. ½ E., and S.W. by W. ½ 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. COLORAS.—The Coloras are a cluster of small islands, five in number, occupying a space of four-tenths of a mile. They lie 1½ mile E. ½ S. from the Easternmost of Diego's Isles, and 1½ 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. 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 5¾ miles, to Port d'Espagne, and there turns about S.S.E. 1½ 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 3½ 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 1½ mile off from the shore, with the round white tower on a hill near the town bearing N.E. by E., there are 3½ fathoms, very soft mud, but ships may anchor anywhere. 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.

Light. On the Jetty Port d'Espagne, thereis a square tower, 50 feet above high water, containing a fixed light, which can be seen 5 miles.

Tide. 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 1½ hour, both at high and low water. The course of the tides, both ebb and flood, being checked by an opposing shore in the corner where the town is situated, they naturally 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. 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 2½ miles in length from N.E. to S.W., and 1½ mile in breadth; it consists of two lofty hills, from which the land in 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. ½ 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. 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 1¼ mile about N.W. by W. ½ W. Its South point lies one mile W.N.W. ½ 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.

CHACHA-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. ¼ 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. 1½ 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 North-westward, with safe anchorage, but difficult to get into or out of, except by warping. At the further end of the bay of Chacha-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. 25½° 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 Chacha-chacare, clears it on the South side: the altitude of the hill on that point, from the top to the sea at its foot, from an angle 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, full and change, at 30 minutes after 2 o'clock. *Chacha-chacare.* *High-water.*

There is another rock lying off the S.W. point of Chacha-chacare, with only 9 feet water on the shoalest part of it, at low-water, with very deep water all round: it is about 40 yards in circumference.

The bearings by compass from the Chacha-chacare rock are, 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.

The channel formed by Chacha-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 anywhere 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 Chacha-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, full and change, at 50 minutes after 3 o'clock. *Boca Mona.* *High-water.*

A ship may anchor anywhere 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, 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 *Boca Huevo, Egg Passage.*

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 closer to the island of Huevo 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. 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 Chacha-chacare. With a flowing tide, it runs with a velocity of 1½ mile per hour; but at the ebb, frequently at the rate of 3½ or 4 miles. *High-water.* It is high-water, full and change, at 30 minutes after 3 o'clock. Although the entrance by this channel is practicable only under the above circumstances, 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 12 o'clock, being three days before the new moon.

Boca Grande 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 Chacha-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. 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 until 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 1½ 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 accele-

rated 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 the 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 further along the North coast.

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-guayrare. The range of high mountains which extends 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 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. It is necessary, however, to be cautious of the sunken rock that lies about 7 leagues S.E. ¾ S. from Point Galere. But, as it frequently happens that 2 or 3 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. As 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 2 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 great 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 for entering the Gulf; and that the best time is with a flowing tide, and with a wind that will insure 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 Huevo Channel, as the only risk is of getting too close to one of the little islets, 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 port 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 port 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 port 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 draught; 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 2½ miles from the shore; the water then shoals gradually to 3 fathoms, about the length of 1½ cable 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 2½ fathoms, at 1¾ mile from the shore. To the North-westward from Naparima Hill, about 7 miles, there are 2½ fathoms 2 miles distant from the land, and this bank is steep, with 10 fathoms not far without it. Go into no less than 4½ 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 are by Captain Samuel Chambers, of H. M.S. 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."

In going through the Great Bocas, be careful of the rock that lies W.S.W. from the S.W. point of Chacha-chacare, as well as that which lies one-third of a mile due West from it.

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 2 miles or less: at the distance of 2 miles she will be in from 7 to 9 fathoms, clear of all risk; and although it may be perceived that the water 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 Quemeda, 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 2 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 current in this channel sets 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 2 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 a 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 current always sets 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 Gallos. 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 steer towards Soldado, 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 course is towards the Soldado, in the same manner as for the second, 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.

A ship may enter the gulf by the South Channels, even by night, if not very dark. 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, if any circumstance, either of calm or want of daylight, render it advisable to wait sometime before attempting to enter the channels, the ship should 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 Chachachacare 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 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 of the Bay of Unare, a distance of 2 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. Off the S.W. point of the bay extends a reef, with several islets upon it, to

* From the Derrotero de las Islas Antillas, &c., &c., &c.

the distance of half a mile. Passing outside of them, at about 2 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 further, 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.

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 2 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 2½ 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 length from the S.W. coast of the large island, it is half a mile wide, with a depth of 8½ to 9 fathoms, red gravel.

The Testigos may be seen at 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. Anchorage may be had here in 16 fathoms, 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.: the current sets West North-westward, 1½ mile per hour. No fresh water to be had.

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, as 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: 2 miles West of Carupano are the Point and Morro of Salines, or of Jarro, with an islet near it, which, with the Point of Hernan Vasquez, form 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 fathoms close to, and lies one mile W.N.W. from the point; the other lies 1¾ mile W. ¾ N. from the same point, and 1¼ mile N.E. from Point Salines: this has 1½ fathom on it, with 4¾ 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. ½ 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 of Point Salines.

Morro Blanco.

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 Taquein which projects further 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. 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 S. 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.

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 Emerald Island. 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 the 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 island 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 hence 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 Cubago 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, as far as Araya, and then return to Margarita and the other islands.

From the Point and Morro Cayman, the coast is level towards 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 as far as Punta del Escarceo, or Eddy Point, where it rises a little; the distance from one to the other is 3¼ 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, has a bank about half a mile from shore, which from the latter point extends 4 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 of 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. The coast continues in the same direction, S.S.E., to Point Barragon; at first it is low and sandy, and afterwards 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 stated, 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 1½ mile 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. In approaching this bay 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 N.E. ¼ E., distant about 2 miles. *The Island of Margarita.*

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 shoalest 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 Balena Point, are Points 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.

Ships from the Eastward having approached Ballena Point to about a mile, should edge away to the S.W., sounding in 12 and 10 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. ½ N., by compass, distant one mile, there is good anchorage in 8 fathoms water; there is little shelter against any weather, and a great scarcity of water and every species of provision.

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 near it in that direction.

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 2 miles of it; the same character may be given to that further 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 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 further Northward, forming another bay with Point del Pozo, which is distant 6½ 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. 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 2 cables' length from it.

Sola Islet. 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 passages 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. *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 1½ mile, and form two channels: that on the North, with the island of Margarita, which in its narrowest part, is 2 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 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 3¼ 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 brought 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 because 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.

Anchorage of Araya.

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 out of soundings. But if thought preferable to use landmarks, 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 2 miles. Hence a ship bound to Araya, 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 2 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 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-eastward with the coast, narrowing by degrees to the vicinity of Mount 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.

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 toward 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. 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 further off shore. The rise and fall of the tide is from 4 to 5 feet. Good water may be obtained in a little river to the Northward of the fort on the beach. The wind always blows off the shore.

Tide.

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 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 three-quarters 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 Campanarito 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, nowhere exceeding 14 fathoms, or being less than 4½; the latter from one to 1½ cable'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 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.

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 has 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 further 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, 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 Campanarito, 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 2 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 all together 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 2 cables' length of the shore, without the least risk. Westward from Punta Comona, almost 2 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 further 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, from which extends a reef about a cable's length from the shore.

Monos Island.

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 anything prevents running through mid-channel.

Point Guanta.

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 empties 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 avoid a reef and shoal from the centre of the bay; which will be cleared by not getting anything 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.

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 track 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.

Barcelona. 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 draught 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 3 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 1½ 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 2 miles. This island forms two channels: one on the North with the Great Chimana, about 1½ cable 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.

Chimana Islands.

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 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. 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 1½ 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 is situated an islet, called Borracha; near the island two small islets, called the Borrachitos, at the distance of 2 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, 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. *Cape Codera.*

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 1½ cable'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. *Hermanos Islets.*

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; and 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. *Blanca Island.*

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, Anguilla 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 the 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. *Tortuga.*

Description of the Coast of 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 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; 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 as soon as there is shelter from the wind, wherever the depth of water may be suitable; with an understanding, that at 2 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. *Cape Codera.*

From Cape Codera the high mountains of Caracas are visible, extending East and West many leagues. Nearly 14 miles N. ¾ 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.

Point Caracoles. From Point Caracoles the coast runs in the direction of W.N.W., a distance of 9½ miles, to Point Maspa, whence it trends W. by S., 2½ 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.

Chuspa. 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 1½ mile, to the mouth of the River Chuspa, on the East bank of which stands the town of Chuspa, about 2 cables' length from the bank.

From the mouth of the river the coast rounds to the Westward for the distance of 1½ 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 the 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 4½ fathoms, in some places there are only 3½, 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 making 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., 29½ miles, to the anchorage of Laguayra, on every part of which a ship may be anchored at half a mile, or even at a musket-shot from the shore.

About 3 miles to the Eastward of Laguayra 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 cocoanut-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.

The Port of Laguayra. THE PORT OF LAGUAYRA, 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 on 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; 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, veers 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. Laguayra cannot be called anything else than a dangerous roadstead: but as the trade-wind blows right along shore, by being prepared a ship may always clear the land. There is good anchorage, the town bearing S. by E., in a depth of 10 fathoms, at 1½ mile from the shore. The rollers are very heavy. The ground is very bad for holding.

Ships from sea bound to 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. *Light.* There is a fixed light on the pier at Laguayra, in lat. 10° 57′ N., long. 66° 56′ 30″ W.

From the anchorage of Laguayra the coast first runs West for the distance of 6 miles, and thence W. by S., 20½ 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 1½ cable's length wide, and 2 cables in extent inward; very clean; for at half a ship's length from the coast, all round, there are 4½ 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 within 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 further 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 of 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, 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 Ciénaga 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 Ciénaga, 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 2 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 further 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. 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.

There is a very good and spacious anchorage between Isla Larga, or Long Island, and the main, about 3½ miles to windward of Porto Cabello. There is plenty of room in 10 or 12 fathoms water. You may sail into, or out from, this anchorage, between any of the islands: but the best passage is round the East end of Long Island, between it and the main, in order to take a berth well to windward.

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.

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, as 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 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. A fixed light is proposed to be placed at the entrance of Porto Cabello.

Light.

The coast to leeward, or to the Westward of Porto Cabello, forms a great bay, called Tucacas, or the Gulf of Triste, in which there are several islets. With the trade-winds it is a lee shore, and rather dangerous. Ships from Europe should keep clear of it, as there can be no inducement to enter. 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.

Light.

There is a fixed light, 30 feet above the sea, on Brava Point. It is in lat. 10° 47′ N., long. 68° 18′ 30″ W., and may be seen 9 miles.

Point Tucacas.

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 2 cables' breadth, which should not be approached at less than a mile. From Point Tucacas, which is to 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 as 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 3 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 round it, half a cable broad. This key, and the islands off the point, form a channel 2 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 a cable's length broad. Between these two there is a channel rather more than 2 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. 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, 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, steer 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.

Chichiriviche harbor.

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 track 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 4½ 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 further, 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 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 for 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., 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., 1½ mile from this point, there is a bank, over which the least depth is 4½ 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 25½ 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 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 2 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 of Paraguana, may be seen from the sea at the distance of many leagues.

Orchila Island.

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 Northward 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 good anchorage, well sheltered from the trade-wind, in 6 and 7 fathoms water, within 1½ cable 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 burden.

S.W. ¼ W. from Orchila, and S.E. by E. ¾ E. from the East end of the Roccas, there is a shoal with 3 fathoms water; the form of the shoal is nearly circular and is about 1½ mile round. Longitude corrected by the Roccas, 66° 27′, latitude 11° 42′.

The Roques.

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 7 miles in length, nearly East and West, very narrow; and to the Northward and Westward of Key Sal, there lie a great num-

ber of smaller ones, without any passage between them. The Northernmost group consists of El Roque, nearly 2 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 3 miles beyond them. The passage 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 3 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.

Light-house. There is a light-house building on Cayo Grande.

Port el Roque. PORT EL ROQUE.—There is a fine harbor to the Eastward of El Roque: 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 Keys, and their reefs. There is a space of about 2 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.

Port El Roque presents considerable advantages, as a safe and convenient anchorage, as from whatever quarter of the compass the wind may blow, a vessel can scarce find a difficulty in getting to sea. Nor, from the manner in which it is locked in, by the keys and reefs, is it probable she would 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.

The channels are clean, and, without 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 is a patch of stiff clay off the N.E. point of Pirate Key, in 13 fathoms.

Fish of excellent quality may be caught in plenty, either with seine, or by anchoring in a boat near the reefs, and employing a hook and line for that purpose. Turtle are met with, but not numerous.

Ships requiring small plank, firewood, 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 anything 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.

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 port, 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.

High-water. On the full and change of the moon, it is high-water at 4h. 30m. P.M. Spring tides rise 3 feet perpendicular.

Islas de Aves. ISLAS DE AVES.—Thirty miles to the Westward of the Roques are the Islas de Aves, (Bird 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 as any other dangerous shoal.

Buen Ayre light. BUEN AYRE LIGHT.—On Point Rasa del Lacre there is a fixed light, 70 feet above the sea, in lat 12° 12′ N., long. 68° 17′ W. This light cannot be seen to the Northward.

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 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. *Buen Ayre Island.*

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. 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 are two small clumps of mangrove-bushes, showing higher than the rest of this land. On the East end there is 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. *Curazao Island.*

On Little Curazao there is a light-house containing a red fixed light, 40 feet high. *Little Curazao light-house.*

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. Ann'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. Ann, 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 stands 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-quarters 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 channel 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.

There is a fixed light on the South side of St. Ann's Harbor. *St. Ann's light-house.*

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 4 miles wide Although low, there are some heights upon it that may be seen at a moderate distance off, particularly one, which is called the Sugar-loaf. All the Eastern coast is very clean, and has islets close to it. On the Western coast there is a chain of keys extending almost as far as the West point. These may be coasted on the outside, at the distance of 2 cables' length, if necessary. This island lies to the Northward of Cape St. Roman, the intermediate channel being 13 miles wide, and very clear. *Oruba Island.*

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 from 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 soundings 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 as far to windward as the Sugar-loaf, and run along shore until the port bears N.N.W., when the flagstaff 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; it may also be procured 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., 13 miles, to Point Macolla. It is shallow and clean, and may be safely approached by the lead. St. Roman bearing E.N.E. ½ E., distant from 12 to 15 miles. and off shore about 3 miles, there is a shoal on which the water breaks, having close to it 15 fathoms. 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 shore. and with the very strong breezes that you frequently get in this channel, it is difficult to get up, except by beating inshore. 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. This 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. 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 may be safely approached to the depth of 6 or 5 fathoms, in every part. Those who enter this gulf proceed to the lagoon, for the purose 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, a S.W. by S., course 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 1½ cable's length from the outermost breakers off Bajo Seco. This Bajo Seco is an islet of sand, which is about 1½ cable over in every direction; it lies N.N.E., at the distance of 1½ mile from San Carlos castle, and at about East from it will be seen the other. The island of Zapara 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, 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 daylight 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. *Tides.*

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 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, where Zapara castle stands. By such a mistake, the ship might be cast away on the shoals.

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, 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.

In sailing from Santa Martha to Maracaybo, round Cape Aguja quite close, and by keeping within 5 miles of the foot of the Snow Mountains, you may carry the Easterly set of the Magdalena up to Cape la Vela.

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 daylight.

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 dar 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,) 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.

To pass the bar, a pilot should always be taken.

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.

You may cross the bar with 11 feet.

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.

Although the Derrotero de las Antillas mentions the depth of water on the bar in the rainy season, from August to November, to be 16½ feet, it is stated by others to be but 14 feet at most. The tides are very strong.

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, and 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 Chica, 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.

There is a shoal with only 2 fathoms on it, in latitude 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 Chimiare will be seen.

Bahia Honda.

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, 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 small 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. The channel between it and the cape is quite clear, and may be run through without danger, there being 5½ fathoms in the middle of it; but it is better to keep nearer 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.

Cape la Vela.

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 Castillettis 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 3½ 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 Birds' Shoal, with 2 fathoms water on it, sandy bottom. *Cape la Vela to Point Manare.*

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 Hacha. 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 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, 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 Sierras 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 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 make the anchorage off the city of La Hacha, which can be known by a new white cathedral, visible nearly 15 miles, and which can be seen before you see the land, and being near the rock or farallon at Cape Vela, it will be necessary to steer S. 53° W., or 55° W., with which course run in sight of that 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 3 leagues out. *La Hacha.*

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., 12½ miles, to the North part of the islet of Cape Aguja, which forms a prominent or projecting front of high hills scarped, with deep water close to, with several covers 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 run great risk.

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 furthest out, which is also the largest, is at the distance of 3 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 *Santa Martha.*

this passage, which is 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. 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.

Light. A fixed light is proposed, and will probably be shortly erected on Betin Point.

There is a rock off Point Betin. It bears 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.

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 the 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 6 miles from North to South, and 8 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 5 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.

Sabanilla Harbor. The harbor of Sabanilla is situated about 7 or 8 miles to the South-westward of the Boca 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.

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 is safe, by attending to the lead; but should not be approached 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.;

hen haul up for it, which is about as high as a ship will lie, as the wind is generally t N.N.E.

But if, in going in, you should happen to get into 7 fathoms water, before you have he 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 he bank, you may have 6 fathoms, and before another cast of the lead can be had, he 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 draught 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 look-out 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. Large vessels may work in by standing no further 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 6½ 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.

About 3½ miles from the nearest shore, with Morro Hermoso bearing between E. N.E. and N.E., distant 5 or 6 miles, there is a rock, with 11 feet water on it, and 6 fathoms all round it.

A frigate might work up 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 5 or 6 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.

Galera de Zamba.

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 1½ mile. 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 2 short miles from the Cascajal. S. 14° W. from the Point Galera of Zamba, and at the distance of 7 short miles, is the West rock of Bujió 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 Uña de Gato, Cat's Claw. The depth on the outside of this shoal is 7, 8, 9, and up to 14 fath-

oms, at the distance of 2¼ 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. 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 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 round 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 7¾ 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.

There is a reef of rocks, Canoas Point bearing N.E. ½ N., distant about 3 miles, consisting of several heads of rocks, about 100 yards in length, with 3 to 5 fathoms between them, 7 fathoms all round them, and on the tops, which are sharp pointed, from 4 to 5 feet.

Carthagena. 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 1¾ mile 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. HARBOR OF CARTHAGENA.—The little tongue of land on which the city is built, extends S.S.W., 2 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 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, which is separated from the main, and by a creek named Passa Caballos, navigable by canoes only. On both points of the Boca Chica there are castles to defend the entrance. This boca, or entrance, is rather more than 2 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 Grand, and in which there are also 14 and 15 fathoms. To the North of this second bay there is an entrance 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 nowhere 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. BANK OF BOCA GRANDE.—From Point Canoas to Boca Grande there is a large bank, on which the depth of water diminishes gradually; 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 gray 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 an account of the great loss of ships which it has caused. This shoal, which is a little more than a mile in

tent from North to South, and a little less from East to West, lies with the follow-
g 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.

In addition to these marks, by which it may with certainty be avoided, in running
om Playa Grande for Boca Chica, ships ought to get into from 6 to 8 fathoms, to the
Vest of the city, and at the distance of 3 short miles from it, and then steer South,
ithout inclining anything to the Westward ; and so soon as the depth increases keep
ore to the port hand, in order to close in with Tierra Bomba to the distance of half
mile ; and run along thus, closing to within a pistol-shot of the North shore, at the
ntrance of Boca Chica, avoiding the South shore, which is foul. To enter Boca
hica, and navigate within the bays, up to the harbor, requires a pilot, and one may
lways be obtained at Boca Chica.

Ships having occasion to anchor and stop in Boca Chica, should haul round the
W. point of Tierra Bomba, at the distance of half a cable's length, and run along
the beach, until the centre of San Fernando castle bears N.E., true, and then
rop an anchor in 13 fathoms, at about 100 yards from the beach. They may then
oor with two-thirds of a cable on the N.E. anchor, and half a cable on the S.W., in
fathoms, which ought to be the bearings of the anchors. When moored, the cen-
e of San Fernando castle will bear N.E., as before, the centre of San Josef castle,
S.E., and the extremity of Tierra Bomba, W.N.W.

As the harbor of Carthagena may be made by ships from the Southward, it is neces-
ry to give some description of the South coast, as far as the islands of Rosario, in
der to connect all the information required for making the land with correctness
d safety.

We have already said that the South coast of Boca Chica is the North coast of the
land Baru. The exterior coast of this island, from the point forming the entrance
Boca Chica, trends S. 35½° W., for 13 miles, to Baru Point. This coast is suffi-
ently clean as far as an islet, named the Farallon of Perico, from which to the South
is very foul, with a reef. To the Westward of this latter part of the coast, that is
om the Farallon of Perico Southward, are the islands of Rosario, of which there are
ur principal ones, with several small islets. The Easternmost and Southernmost
these, which is also the smallest, is named Isla de Arenas, and it is distant from the
ore of Baru scarcely 1½ mile ; but the channel between them is reduced to three-
arters of a mile, by the reefs and shoals which extend from both sides. W.N.W.
W., at the distance of 3½ long miles from Arenas Island, is the Island of Rosario ;
d to the Northward of these two, is that named Isla Larga, or Long Island, which
the largest, and which, with its banks, shoals, and islets, extends out to the West-
ard further than the Rosario Island. To the Northward of the middle of Isla Larga,
a little more than 3 miles distant, lies the Islet Tesoro, with a reef to the Westward.
he channel between them has from 17 to 25 fathoms water, on a bottom of sand and
cks, from which Boca Chica bears N. 63° E., distant 10½ miles. By the chart it bears
. 57° E.

The Rosario Islands are very foul, and no one should sail among them unless well
quainted ; but always keep at a sufficient distance to the Westward, in order to
oid the shallows which extend out from them. About S.S.W., distant 7 miles
om Rosario Island, there is a shoal called the Tortuga. These islands are fertile in
ees, and to the Southward of them there is good shelter from the trade-wind. Be-
des the bank of Rosario Island, there are two others, one 3½ miles to the W.N.W.,
d the other 2½ miles S.W. by S. Both are rocks and sand, with 6 and 7 fathoms
ater on them.

Observations 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 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 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 Pasque, 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 windward, 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 run 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 1½ 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 daylight. 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 inthe 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 currents set 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 the 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 Aguja to the 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 sunrise and 9 or 10 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 nightfall, 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 the 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.

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 of 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 2 fathoms; and there is another, lying S. 80° W., 2¼ 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 Islets 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.

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, 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, as 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.

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, green ooze: therefore a ship may anchor in any part of it during the season of light breezes, calms, and variable winds.

Tolu.

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 6 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 as 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.

Puerta de Cispata.

PUERTA 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 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 2 miles from the little bay of Zapote. The highest points of Cispata Hill lie 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 semicircle towards the West and South, passing by the Southern slope of Cispata Hill, including to this point the village of 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 17½ miles: in the intermediate space, and on the bearings mentioned, are found the Ciénaga de Venados and Punta del Viento, (Wind Point,) between which is the part where the bank extends furthest from the coast; for there it extends 3½ miles Northward, and 6¾ miles Westward, with a depth of 3, 4, and 5 fathoms, sand and rock, and also 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 2 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 5 long miles S. 39° W. from it, is Punta Broqueles, low and rocky, with a reef which extends out Northward 2 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 Elsenada de la Rada, which has a low beachy shore; it is shallow, with 3¼ fathoms, on oozy bottom, at the distance of 8 to 9 $\frac{9}{10}$ of a mile. S. E. from this bay a ridge of hills may be seen, extending N.E. and S.W., having three remarkable peaks, the highest and largest of which lies about 5 miles South-eastward from Point Broqueles.

sla Fuerte. ISLA FUERTE.—The N.E. end of Fuerte Island lies S. 84½° W., 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 back, 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, sand, lies S.S.W. from the island, distant one mile; and the other, with 5½ fathoms water, 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 Broquelles 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 fronton 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 Broquelles 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 *Caribana Point*
ready said, is the Northernmost point of the Gulf of Uraba: it is low, with trees on , and surrounded by rocks close to it. It is readily known, because from it the coast tends to the South to form the said gulf, and also by the Cerro de Aguila, 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 N.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. *Shoals.*

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, further 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, oozy sand; at 11 miles, 21 fathoms, ooze; and, lastly, at 14 miles, 32 fathoms, ooze. These soundings, with the bearings of Aguila Hill, may serve to direct those who are bound to the gulf; observing that as 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 5¾ 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. *Gulf of Uraba, or of N. Darien.*

ARENAS POINT.—The North and South points of Arenas form a low front of 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 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. *Arenas Point.*

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. *Rio Salado.*

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 *Bay of Candelaria.*

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 Faysan 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.

Tide.

Choco Anchorage. 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 2 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 further into the bay, you may anchor in 13 or 14 fathoms.

Peaks. PEAKS OF TARENA, CANDELARIA, DE CABO, AND GANDI.—Ont his 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. 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 further 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 1¾ 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. 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 Har-

bor, 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 North 62° W. from Cape Tiburon are 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 2 miles to the Southward of Point Carreto, is a little harbor, called Puerto Escondido, fit for smugglers only. *Point and Peak of Carreto.*

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 1½ mile, but the narrowest part of the mouth is only a mile. This harbor is of a semi-circular form, and extends inward about a mile; the depth of water in it is not less than 3½ 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 Harbor.*

CARRETO SHOALS.—To the North of this harbor, at the distance of a long mile, there are two small shoals near each other, bearing N.E. and S.W., with 5½ fathoms over them, rocky bottom, and near them from 20 to 25 fathoms; with fresh breezes the sea breaks over them. *Carreto Shoals.*

Seven miles N. 48° W. from the Point and Peak of Carreto is Punta Escoces, or Scots' 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 3 miles South-eastward 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. point 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 3 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, sandy bottom. *Caroline Bay.*

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. *Grande del Oro, &c.*

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 Caroline, 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 fronton 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. *Caledonia Bay.*

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 4 cables' length wide, with a depth of 8 to 11 fathoms, ooze; and further 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. *Sasardi Channel.*

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 4½ 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 fronton 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 1½ mile to the Westward of the fronton or point of Sasardi, there is a bank with little water on it.

The fronton of Sasardi is projecting, round, scarped, and surrounded by reefs close to the shore. From the most salient part of this fronton, 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 Ciénaga 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 Birds' 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. 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 1¾ mile, 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.

Chichime Channel. 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.

Channel of San Blas. 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 1¾ mile.

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 South 50° W., through the middle of San Blas Channel, which, as already noticed, is 1¾ mile 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 fathoms on it, lying N. 69° W., distant a long mile and a half from Cabras Islet. The passage is betweeen 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.

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, 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.

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 Ciénaga, a mile and a quarter further 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.

POINT ESCRIBANOS.—Cocos Point advances into the sea, and from it the point of Escribanos bears S. 80° W., 1½ mile, 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 one and one and a half fathoms 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.

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-

head. 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. 33° W., distant 8¼ miles from Escribanos Point.

Terrin 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 ciénaga, 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 tend furthest 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., 3¾ 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 Manzanilla is high and scarped.

The Point of Manzanilla 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 Manzanilla 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 furthest 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 1½ cable; 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, 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 2 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 $\frac{3}{10}$ of a mile, with 5 and 5½ fathoms water, sand. This island of Bastimentos is foul on its S.E., S., and S.W. sides; and the latter, with Cabre 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, 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.

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, 1½ mile, to the mouth of the Boquerons. 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, 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 vendavales 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 the rock, on which the sea breaks. The channels between it and Cabra and Pelado Islets have a depth of from 14 to 17 fathoms, mud.

Boquerones Point and Islet.

BOQUERONES POINT AND ISLETS.—S. 64° W. from the highest part of Tambor Islet, at the distance of $3\frac{8}{10}$ miles, 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.

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 Sucio, 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 $\frac{7}{10}$ of a mile, forming a channel between both, with 4 to 7 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, 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.

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 are separated a little more than 2 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 furthest out, and is surrounded with rocks and reefs. Sabanilla Point has also a reef, and some rocks.

At the distance of 2 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.

PORTO BELLO, or PORTO VELO.—This port is capable 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 1½ mile; 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., 1½ 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 fathoms 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., 3 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 round, 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 round it, and in the channel between it and the islet there are from 11 to 26 fathoms water, clay.

At three-fifths of a mile South from Drake's Islet, and $\frac{7}{20}$ of a mile 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, clay.

Fresh Water.

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. The battery of San Geronimo, at the city, is in lat. 9° 24′ 22″ N., and long. 79° 43′ W.

To the Southward of Porto Bello, at the distance of a long half-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 Shoal. 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.

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 fronton 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, 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, clay. *Shoals.*

There is a reef off Manzanilla Point, with the island of Bastimentos bearing S.W. by W. by compass, distant 3 miles, and Monkey Island S.E. There are 3 fathoms water on it, and 7 or 8 fathoms round it.

There is also a shoal of 6 fathoms, with 20 fathoms round it, 4 miles W. ½ S. of Tambor Island, Manzanilla Point bearing S.W. by compass. The bottom is rocky.

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 small shoal, that is distant 3 cables from it, N.W. by N. *Manzanilla Point.*

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. *Manzanilla Harbor.*

Five miles S. 68° W. from the fronton 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 2¾ miles. Toro Point is salient, high, scarped, and bordered with reefs, extending out 2 cables' length, or more, 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, 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. 25° 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.

NAVY BAY.—Navy Bay is 2½ miles wide and 3½ deep, open to the Northward. Four fathoms of water can be carried 2 miles within the bay, with bold shores on either side. Under Point Limon is a three-fathom anchorage, but all the rest of the bottom of the bay is shoal water. *Navy Bay, or Aspinwall.*

Point Toro to the West, and Manzanilla Island to the East, are the extreme points of land forming Navy Bay. A reef extends from Point Toro N.E. half a mile, upon which the sea always breaks: beyond this, a cable's length, are a few detached rocks, upon which breakers are visible during the ordinary "trades." Manzanilla Island, which forms the East side of Navy Bay, is one mile N. and S. by half a mile E. and W. This island is owned by the Panama Railroad Company, and is made the terminus of the railroad, connecting the Pacific with the Atlantic. Several wharves have been run out to 26 feet of water, and others are in course of construction. The place is called Aspinwall. On the extreme N.W. point of Manzanilla Island, is a fixed white light, on a frame-work of timber, elevated 50 feet above high-water, visible 10 miles at sea, at the ordinary elevation of the eye. *Light.*

ASPINWALL.—Bound to Aspinwall, or any of the ports in the Caribbean Sea, through any of the windward passages, the course should be steered so as to allow 20 miles Westerly drift in the 24 hours.

In running down for Aspinwall near a S.S.W. course, the high land of Porto Bello is first made, bearing near S.E. by S., some 50 miles. This high land slopes away to the S.W. and disappears; immediately to the right the woody high land about Chagres becomes visible. The gap between these highlands is Aspinwall harbor.

When off Porto Bello, and within 5 miles of the islands off the port, steer S.W. for Aspinwall. Should the weather be thick, and it very frequently is so, and you fall in with Point Longarremos, you will know it by the mangrove keys and the breakers about them. Do not go closer than 12 fathoms water.

The land to the Westward of the harbor makes like main-land. It is low, but entirely unlike the keys about Longarremos. At the termination of Point Toro, when at the distance of 5 to 10 miles, it makes as if there was a small round island near the point.

In clear weather the town can be seen, and at night, the light. The bay is wide and clear. Steer for the town, or light, from S.E. to S., or any point between them. Run up off the town, and anchor in 6 or 7 fathoms water, at a distance of a quarter of a mile, or closer.

A coral reef makes out one cable's length distant from the light-house. Just beyond its limits, in 36 feet water, is a large iron can buoy, painted white, with an imitation flag on top. South of this, 100 feet clear of the Western limit of the reef, is placed, in 34 feet of water, a barrel buoy. Outside of these buoys, and in front of the town in any direction, there are no dangers whatever. The U.S. Mail Steam-ship Company have several large buoys placed off their wharf for the purpose of securing their steamers. The Panama Railroad Company has placed three mooring buoys of the best description, at such points in the bay as render them very convenient and useful, and contemplate building a breakwater from the light-house, 1500 feet in a South-westerly direction. This will protect the wharves from every wind. Now the front of the town is exposed to the N.W. gales, which may be expected during December and January. They are, however, of rare occurrence, and seldom violent. From May to December is the wet season. The winds prevail during this period from S. E. to S.W. and W., light airs and frequent calms, with heavy showers of rain. From December to May is the dry season. The N.E. trades then blow home a steady fresh breeze. As the shore line of Aspinwall inclines half a point to the West, the wharves and anchorage immediately in front of the town are completely sheltered, the slightest swell scarcely ever being felt there during these winds.

Mean rise and fall of the tide, 14 inches. Mean range of the thermometer (yearly) 72° to 88°.

Chagres.

CHAGRES.—From Chagres Point to the West point of the Peñon, or rock, on which stands the castle of San Lorenzo, is about 1½ cable's length S. by E. The Peñon is scarped to the N.W. and South, and the castle of San Lorenzo, as we have said, is situated on it. This Peñon to the North, with Point Arenas to the South, form the mouth of Chagres River, which, at the widest part, is 2 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 narrows between the Peñon 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 Peñon, 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 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 Peñon, 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.

Directions for sailing from Jamaica, to and upon the Coast of Colombia between Escudo Island and Carthagena, including Chagres and Porto Bello.

Jamaica to Escudo Island & Chagres.

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 until the middle or end of November, the E. and N.E. trade-winds seldom blow home to the Main; therefore, ships should never go to the Southward of the parallel of 11°, 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 afore-mentioned 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 inshore, 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 7° E.

Chagres to Porto Bello.

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. Should light winds prevail, which is generally the case from May to the end of November, 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 port 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 port 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.

Salmedina Shoal.

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 are 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, they should anchor about a quarter of a mile below Fort Fernando, which stands on the North shore, and is easily seen; then they 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.

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, as 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 to 3 miles an hour. Should you, how-

ever, be unavoidably drawn in near the land of Porto Bello, be constantly on your guard, 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 it is much influenced by the prevailing wind 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 is in latitude 9° 45′ N., longitude, by chronometer, 75° 57′ W. These islands are low, but very remarkable: when at the distance of 10 or 12 miles, 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: 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.

The Coast from Chagres to Boca del Toro of the Chiriqui Lagoon..

Escudo Island. 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 is in 81° 33′ 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 Valiente 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 sets strong to the Westward.

Green Bay. 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 Valiente. 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 port 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.

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 Valiente Channel, which is about 2 miles wide, lying North and South, with from 23 to 14 fathoms water. Point Valiente is in lat. 9° 11′ N., long. 81° 53′ W. The Western side of this channel is formed by the Zapadillas and Water Keys; 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 Valiente Point. The Tiger Keys lie 1½ mile from Valiente 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 look-out 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 mark 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: *Chiriqui Lagoon.*

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 Valiente South Point come on with the North Valiente 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 the North and South Valiente Points appear in a line. You will then be on a bank of 3 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 Malo 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, muddy bottom, with Valiente Point bearing N. by W. ½ W., and the East end of Water Key N.W. ¾ N., or you may go further 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 a 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.

Remarks on the Coast of Nicaragua.

Near the River Tortuga 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 Bogue. The land to the Eastward is very low, and perfectly level. To the Westward it is 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. There are 50 fathoms 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.

SAN JUAN DE NICARAGUA, OR GREYTOWN.—Bring a remarkable tree on the main-land opposite Point Arenas, and bearing from it West, Northerly, to bear S.W. and steer for it; or bring the beacon on Point Arenas open to Eastward of a remarkable white house to the Westward of the town, and steer for it, giving it a berth of one-fourth of a mile until the centre of the town bears S.E. by E., when you may run in on this course and anchor, off the town, in 4 fathoms, with Point Arenas N.W. by N. During the Northers, haul up rather sooner, and anchor off Point Mandeville, in 5 fathoms. In going out, beware of the current, which sets on the spit. *San Juan de Nicaragua.*

From Chagres to Cape Catoche.

The coast between Porto Bello and Valiente Point.

THE COAST BETWEEN PORTO BELLO AND VALIENTE POINT.—From the last low point without a name, 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 8 leagues, to Valiente 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 four 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 North-west and South-east, 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 1552 feet high, 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 1432 feet high, 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 Boca 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 Veragua, (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 3 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 it is not sheltered from the breeze, but also because the bottom is rocky, and may chafe the cables.

From Point Valiente, already noticed, and which is situated in 9° 11′ of North lat. 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 Valiente and the Eastern-

host keys of the group; and, according to our information, although shallow, there depth of water sufficient, both in the channel and within the lagoon, for vessels of ll burdens. Almirante Bay must be entered exclusively by the channel which is rmed by Punta Gorda de Tirbi and the Westernmost key. In this mouth, and within e bay, there is, from the same authority, depth of water sufficient for all classes of essels. This channel is called the Dragon's Mouth, Boca del Dragon, to distinguish from another more to the Eastward, called Boca del Toro, by which only small essels can enter. Within both bays the anchorage is as well sheltered and secure s the best harbors; but as we possess no information respecting them, we shall say o more than that to enter in or go out by the Dragon's Mouth, you should give a good erth to the Western coast, or that of Punta Gorda de Tirbi, on account of a rocky eef that runs out from it to mid-channel.

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 iles, to Punta 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 ear it. Thence the coast trends N. 3° W., 26 miles, to the point of Arenas, which rms the harbor of San Juan. All this coast is clean, and the water deep, and sevral rivers disembogue in it, of which the principal is that of Martina, or Port Carayo, or Cartago, and that of San Juan. The last discharges its water by several ouths, one of which enters the very harbor. *Coast between Punta Gorda and San Juan de Nicaragua.*

From the harbor of San Juan de Nicaragua, the coast trends to the North a little Westerly, a distance of 80 leagues, to Cape Gracias á Dios, and what is properly alled Mosquito Shore. It is all low land, for the high lands terminate at San Juan; nd in this extent there are numerous rivers and lagoons. A bank of soundings exends all along it, being about 8 miles from the shore, at Point Arenas, and running ff, in a North-easterly direction, into latitude 16° 33′ N., and longitude 81 W.

Upon this bank there are a number of keys and reefs, and those of Cape Gracias á Dios are very dangerous.

COAST BETWEEN ARENAS POINT AND THE PIGEON KEYS.—North f Point Arenas, 30 miles distant, is Point Gorda; the coast between forms an extenive bay, called the Gulf of Matina. About Point Gorda, and near it, are several slets, which, with the coast, are clean; and the soundings are so regular that no other uide is necessary than the use of the lead. *Coast between Arenas Point and the Pigeon Keys.*

From Point Gorda the coast trends to N., about 3 leagues to Point Monkey, S.E. of which there are several keys very clean; and between them and the coast there is n anchorage in 3 fathoms water: this anchorage ought to be entered from the Southward of the islets. To the North of the point there are others, which rise upon the bank and reef, called the Pigeons, extending about 12 miles from North to South. To he 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.

BLEWFIELD'S LAGOON.—Abreast of the Pigeon Keys, on the coast, is the Southern point of Blewfield's Lagoon, which is a bay extending inland to the Westward about 10 miles, and receiving in its Northern part a considerable river, called Rio Escondido. From the Southern point of the bay, or lagoon, to the Northern one, called Blewfield's Point, the distance is 12 miles N.; the latitude of this point is 11° 59′ N., it being the mean of several observations. Nearly on the line between the two points, is a key 7 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 of 3 feet. In the time of the vendavales, or rainy season, there are 2½ fathoms, without any fall. *Blewfield's Lagoon.*

Having passed the bar, or channel, there are within the bay 5 and 6 fathoms water, clay; the anchorage is near the town, on the N.E. side. To enter the lagoon you have only to keep along by Blewfield'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 Blewfield's Point the coast trends North, inclining a little to the West, for the distance of 21 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 Blewfield'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 *Pearl Lagoon.*

going. The entrance of Pearl Lagoon has deeper water than that of Blewfield's: there is also anchorage on the outside of it, under shelter of the North coast, which rounds to the E.N.E., a distance of 8 miles, to Pearl Key Point.

Pearl Key Point. PEARL KEY POINT.—A reef runs off E.S.E., 4 miles distant, from Pearl Key Point. From that point to Man-of-war Keys, in lat. 13°, there are also a number of keys and reefs, some 14 miles from the main-land. From lat. 13° to Fox Reef, lat. 13° 30′, the coast is clean up to Blackman's Bluff, lat. 14° 4′.

Between Blackman's Bluff and Morrison's Keys, there is a good channel of 8 miles in the narrowest part, up to Cape Gracias.

From lat. 14° 5′ to lat. 16° 7′, the Northern point of the Caxones, or Hobbies, and long. 82° 22′ to 83° 24′, the bank is full of keys and reefs, with channels between them, and which can only be used in daylight with the charts as guides.

Island of St. Andrew. ISLAND OF ST. ANDREW.—There is a fine bay on the West coast of this island. 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 anchorage is with a small inlet lying nearly East, 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 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 side of the point a little open of the port 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.

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. The East coast is bounded by a reef, which extends 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. 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.

Currents. The currents about these islands are very irregular, setting occasionally in every direction, but generally to the Northward and Southward.

The S.S.W. Keys. 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 any interruption.

The E.S.E. Keys. 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. 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 around 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 running 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. Latitude of the bay by observation is 12° 17′ N. Variation of the compass 7° 20′ E. *Tide.*

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 breaks when it blows strong. 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 up 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 2½ fathoms, on 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 further to windward than by going to the Westward round the ledge. The latitude observed at the anchorage is 12° 13′ N., and the longitude 83° 3′ W. *Great Corn Island.*

This island is very conveniently situated for those bound to the harbor of Blewfields, 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 they may stay in safety until the weather settles, that they can get in.

BLOWING ROCK.—S. 7° E., 7 miles distant from Great Corn Island, there is a rock above water. *Blowing Rock.*

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 anything more than a rock, extremely craggy, and mostly covered with stones. The highest parts of it are exceedingly 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 acclivity 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. 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 10 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. *Santa Catalina & Providence.*

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° 3′ W. long. *Musketeers.*

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. *Quita Sueno.*

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	"

SARRANA.—East, 52 miles from the Eastern edge of Quita Sueno, is the Sarrana Bank. It is of a triangular shape, longest from N.E. to S.W., being 20 miles long. On the S.W. point there is a key. The N.E. and South sides are bounded by reefs. *Sarrana.*

North point	14° 28′	N. lat.,	80° 17′	W. long.
East point	14 24	"	80 8	"
S.W. point	14 16	"	80 23	"

Serranilla. 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. 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 1½ mile 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. THE BAXO DEL COMBOY does not exist: particular search has been made for it, but it could not be found.

Great River. GREAT RIVER.—From Pearl Key Point, already mentioned, the coast trends about N. 7° W., a distance of 30 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 the point, there are two keys, the Easternmost of which is called Seal Key. 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 S.E. by E. from the mouth of the Great River, at the distance of about 14 miles. Next to these follow the Tyra and Man-of-war Keys. The Northernmost of the Man-of-war Keys lies about 11 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 enter 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 Apulca River. PRINCE APULCA RIVER.—To the N. by W. from Great River, at the distance of 34 miles, there is another, called Prince Apulca, from which, in the same direction, at the distance of 25 miles, is the River Wava.

The coast to Blackman Bluff. THE COAST TO BLACKMAN BLUFF.—From the River Wava the coast continues to the N.E. for 13 miles, to Blackman Bluff. This last part of the coast forms a bay, sheltered from the North and Westerly winds, and in it you may anchor in any depth that suits you, understanding that at 2 miles from the land there are 4 fathoms, upon coarse gray sand and small shells. Great care should be taken in landing from 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 á Dios. THE COAST TO GRACIAS A DIOS.—From Blackman Bluff the coast trends about N.N.W., a distance of 6 miles, to the River Hueson, 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 there the shore runs about N.N.E., 15 miles, to the Gordo 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 7 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.

From Sandy Bay the coast trends to the North 21 miles, to the Wano Lagoon, and thence to the bay of Gracias á Dios it is 7 miles in the same direction.

The Bay of Gracias á Dios. THE BAY OF GRACIAS A DIOS is formed by a tongue of land, extending to the Eastward more than 4 miles, 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 á 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 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.

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 draught 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 further, 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 further to recommend. *Anchorage of Gracias á Dios.*

The canal 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 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, that the depth of water is gradually diminishing, and particular attention should on that account be paid to the lead.

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 á Dios, which are named the Mosquitos and Thomas' Keys. These keys, with their reefs, form, with the coast, a channel 4 leagues in breadth where narrowest; and although between them there are passes with the 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; as 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 á Dios you may steer S.S.E., which 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 West, 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 à Dios the coast runs about N.W., for the distance of 10 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. 6 miles; but the coast bank preserves its regular soundings, and it even seems as if they extended to the Sarranilla; but however that may be, it is 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 Cape Gracias á Dios Westward.*

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 *Black River, and method of anchoring off it.*

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 an ordinary breeze, it is necessary to ride with two-thirds of a cable out, and as 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 on 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 Gracias á 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 anchorage of Gracias á 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.

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.

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., W., 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.

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 2 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.

GUANAJA, or BONACCA.—North from Point Castilla, at the distance of 8 leagues, is the island of Guanaja, about 3 leagues in length, N.E. and S.W. It is en-

tirely 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 port, 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 illustrate what has been said of it.

Rattan.

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 1½ cable'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 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 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.

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.

Utila Island.

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 2 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.

Triunfo de la Cruz.

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 the 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 2 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. 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. 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 2 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 8 fathoms, until you have passed the red gullies; you may then steer direct for Omoa.

Omoa. OMOA.—The harbor of Omoa is formed by a low point of land, covered with mangroves, which projects out to sea. It is now fit for vessels drawing 12 feet water only. 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, 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.

Light. On the fort at Omoa, there is a fixed light, 60 feet above the sea, in lat. 15° 47′ 10″ N., long. 88° 03′ 45″ W.

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 three or four 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. 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; 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 Blackman's Bluff.

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. 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 á 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, 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.

Off Patook River, which lies at a considerable distance to the Eastward of Black River, the fresh water, where it joins the sea, forms a distinct line, being very brown and muddy, and has the appearance of a shoal.

Off the Caratasca Lagoon it is shoal to some distance. 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 the 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. 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, 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 2 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. Latitude observed, 14° 59′ N.

Sandy Bay. SANDY BAY lies about 9 leagues from Cape Gracias á 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. The coast here trends nearly North and South. 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. 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′.

You anchor to the 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. TREBUPPY is about 7 leagues to the Southward of Sandy Bay. 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 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 are, Blackman's Bluff, S.W. ¼ W., the river's mouth West, and the Northernmost land N. by E. Latitude observed, 14° 8′ N. The current sets to the Southward.

Neither wood nor water to be had here, except procured from the Indians, and brought off in their craft.

Blackman's Bluff. BLACKMAN'S BLUFF makes off in a point from Trebuppy, about 5 miles, and has somewhat of a bay to the Southward of it. You may run in until the bluff bears N.N.E. ½ E., and anchor 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 this anchorage there are 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. There are no Indians living here. There is a considerable rise and fall of the tide in the river, but at the anchorage there is only a small southerly current. Latitude observed, 14° 3′ N.

Tide.

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.

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. Further West, at from 1½ to 2 miles distant, the bottom becomes foul, with very irregular soundings, from 10 to 4½ fathoms. 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. Cocoanuts are in great numbers on the North side. Water cannot be had, though it probably may be found by digging.

Observed latitude of the West island, 17° 24′ N.; longitude, by chronometer, 83° 53′ W.

Misteriosa Bank. MISTERIOSA BANK.—North, 90 miles distant from the Swan Islands, is the Misteriosa Bank, in lat. 18° 52′ 42″ N., long. 83° 51′ 37″ W.

Albion and Maud's Bank. THE ALBION AND MAUD'S BANK, described in a former edition of this work, are without doubt the Misteriosa Bank.

Glover's Reef. GLOVER'S REEF.—The bank is in general very dangerous. With the common trade-wind the current sets strongly over it to the Westward.

It has two sand-spots on the North end, and 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 4 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. Light.

BALIZE, or BELIZE.—Pilots for Balize are always in readiness at Half-moon Key, (the S.E. key,) on the East end of which is a fixed light, 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.

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 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.

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.

Lights.

There are three lights on English Key similar to those on Mauger Key, described below, lat. 17° 19″ 35′ N., long. 88° 04′ W.

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. ¼ W., where you will have 2½ fathoms, on muddy bottom. Ships of greater draught 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.

Mauger Key. MAUGER KEY.—The course from English Key to Mauger Key is N.E. by N., 6 or 7 leagues. It is 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.

Lights. On Mauger Key there is a triangular light, formed by three lanterns hoisted on a flagstaff. The lights are on the North-west point of the key, and bear from the N.W. point of the reef E.S.E., so that a vessel by bringing the two lower lights in one, at a distance of 4 miles from the key, may safely shape her course S.S.W. for English Key, distant from Mauger Key about 7 leagues, where, if no pilot offer, by keeping the English Key lights well on board, and a good lookout, a small sandy spot will be clearly seen, and anchorage can be had on the edge of the bank.

The latitude of the lights is 17° 36′ N., longitude 87° 46′ W. The upper light is 95 feet above the level of the sea, and the two lower lights 75 feet. The lights can be seen distinctly, in clear weather, at a distance of from 14 to 15 miles.

Swan Islands. SWAN ISLANDS.—The courses and bearings are magnetic. The North side 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 1½ mile. The Easternmost of these islands is not low, and may be seen in clear weather 18 or 20 miles off. The discolored water extends a full mile off from the E.S.E. part along the South side to the West end, where it extends 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, 83° 48′ W.

From 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.

Light.

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.

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 lights seen in the space between the cocoanut-trees. The course from Mauger Key to English Key is S.S.W., 20 miles; but 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. 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.

Between the anchorage and Mauger Key there is always a Southerly set; it is, however, influenced by an ebb and flow of the water, but not very strong. The edge of the reef of Mauger Key is about 2 miles off. Unless very dark, by keeping a good lookout, you may see it in time to avoid danger.

Current. Navigators should guard against a strong current, which almost always sets between Mauger Key and the opposite keys, about N.W. This current sometimes sets Westerly, and then to the Southward.

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. 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 valuable kind of dye-wood, named Brazilletto. In most seasons it is plentifully stocked with many kinds of game.

The whole of the shore of 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.

EL CHINCHONO.—The shoal called the Northern Triangle lies at the distance of 13 leagues to the Northward of Mauger Key. When the trade-wind prevails, a current, often very strong, sets down between Mauger Key and 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 sail to leeward of the Triangle, you will have a strong current in your favor. *El Chinchono.*

The South end of the Triangle Reef is from 4 to 5 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 is of moderate height, extending N.E. and S.W., upwards of 7 leagues, and is about 2 leagues in breadth. Its East side is 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. Passing the North-eastern breakers at a distance of half a mile, having 12 fathoms, and rounding them gradually, you may stand into a bay on the West side of the island, and anchor in 6 fathoms, on rocky bottom, at about 2½ miles from the beach, with the N.E. point bearing East, distant 5 miles. From this spot you can plainly see the main-land of Bacalar to the Westward, which is rather low, with a number of large trees along the shore. *Cozumel Island.*

The N.E. point of Cozumel is 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; on the South part the trees appear much larger, but of the fustic or logwood kind.

Off the North part, or end, the soundings extend to a considerable distance Northward from the reef before mentioned. You will have 13, 14, 20, and 16 fathoms, on rocky bottom. In lat. 20° 50′, and long. 76° 40′ you have 16 fathoms, on rocky bottom, with strong rippling, similar to the Gulf Stream, the set being N. by E., 2½ knots; at this point the bank appears to terminate.

The current to the Eastward of Cozumel sets N. by E., at the rate of 2 knots: but to the Westward, between the island and the main, it runs South-westward, at the rate of 2½ knots.

The variation of the compass is 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.

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.

ANCHORAGE.—There is good anchorage 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 of 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. It is stated that fresh water is to be found. *Anchorage.*

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 Orinoco to the River Amazon. 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.

PORTUGUESE GUYANA.—The Amazon is considered the first or largest river in the world. The sources of this river are within 2 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.

Tide.

The declivity of the bed of the river, from Ovidos, has been computed at only 4 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 mountain 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 2 leagues.

French Guyana.

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.

Dutch and British Guyana.

DUTCH AND BRITISH GUYANA.—Dutch Guyana, or Surinam, extends from the Marowyne 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 Orinoco, 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 Orinoco, 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 6 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 many 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 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 water; but be very cautious not to be hauled further 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 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.

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 gradually 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 Demerara to Surinam in the space of 3 or 4 days.

Surinam River.

SURINAM RIVER.—It is advisable for ships bound for Surinam, when coming from the Eastward, or long voyages, to get into latitude 5° 55′ in the longitude of 50°, (unless they have a time-keeper, or lunar observation, to depend on,) as 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 arrived in the above latitude, and having found no bottom with 60 fathoms, you ought to keep directly to the South-west, because it is certain you are then about the meridian of Cape North, or perhaps still more to the Eastward, where the current, with uncommon velocity, sweeps to the North and North-west, by which one may be prevented from gaining Southing. With a South-west course you may the soonest be able to pass through the current, and enter the boundary of the tides, which should be your principal aim.

Having gained ground in the latitude 5° 55′, already quoted, and a depth of 60 fathoms, fine sand with mud, you may be certain of having arrived nearly to the meridian of Cayenne, at least not more to the Westward.

To the North and N.E., from 20 to 30 leagues off the Marowyne shoals, are the depths of 30 to 45 fathoms of water, the bottom soft mud with fine sand and broken shells. To the Marowyne shoals you should not, in the night, approach nearer than in 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 of water, heaving-to with your lead to the Northward, you will drive clear enough of the shoals to the North-west. You may always know whether you are to the Eastward, and consequently to the windward, by the soundings; for the ground, 6 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, not only by the high land lying at a great distance inland, but best of all by the appearance of its mouth, bending towards the N.E., in which this stream differs with nearly all the other rivers on this coast, as no one of them shows its entrance open in that direction. Its sand and clay banks also lie dispersed to the N.E. and N.N.E.

The coast between the Marowyne and Surinam River lies still uncultivated, with the exception of Mr. Cameron's plantation; and nothing but thick wood, of an almost uninterrupted uniformity, presents itself to the view, without the smallest emerged object; from this reason ships ought to run as near the land as their draught of water will permit, which they may do with perfect safety, there being no known danger; to this they are the more compelled as the espying the few existing marks requires the utmost attention, from their being projected against a wood, the trees and leaves of which are of different hues.

In making Post Orange, (which is in longitude 54° 36′,) you will see the Dutch flag hoisted there, and a few houses, of a dark brown aspect, lying nearly hidden in the forest. This post lies nearly 13 leagues to the Westward of the Marowyne, and at about the same distance from Bram's Point.

It ought to be remarked that, although in former times there may have existed some likeness between Post Orange and Bram's Point, at present none such is to be found; the large tree at Post Orange, mentioned in former descriptions, is probably fallen or dead, and the flag only may serve to distinguish the spot. At Bram's Point, however, no flag is now to be seen.

About 5 miles to the West of Post Orange is the Motkreek, where also the Dutch flag is displayed as a mark for ships; a few houses, in a similar manner, lie scattered among the trees.

The next mark you have (for you must be very attentive in keeping a good lookout) is a break in the land, through which appear the houses and buildings of a plantation called Cameron's Castle. The mansion, a large structure, painted white, has a steeple upon its roof, which makes it the best mark on this part of the coast.

From here the mud-bank begins to spread further off shore; the lead is your best guide; and by keeping all along its edge, you will discover, in due time, the buoys, placed along the channel which leads over the bank into the river. When seeing the land leading inward to the S.W., and marking the trees opposite the ship, you may perceive a row of trees along the forest bank without leaves, and of a singular brown, burnt aspect; these trees have been known, during at least half a century, by the name of Krabbebosch or Crab-wood.

As Surinam River disembogues towards the West, you may not see its Western bank before you have discovered the outer vessel, which serves as a mark to lead over the bank.

In 1817 a beacon was erected on Bram's Point, but since 1832 it has broken down, together with the houses, flagstaffs, and every other object previously existing; so that, at present, not the smallest trace of human habitation is to be seen there. Instead of the beacon, there have been placed four marks along the windward side of the channel, leading over the bank towards the river, which consists of two iron vessels with masts, and two copper buoys, placed in the following order:

No. 1—*The outermost vessel* with Bram's Point South 19° East; and No. 2, the other vessel, South 10° West, in latitude observed 6° 1′ 30″, and has 2½ or 2⅔ fathoms around it.

No. 2 has Bram's Point South 37° East, and No. 3, being one of the buoys, South 11° East: it lies in 2½ fathoms of water. N.B. These bearings are true.

No. 3 lies in 2¼ fathoms of water, to the Westward of the sand-banks which extend from Bram's Point, with the Easternmost point of land bearing North 74° East; Bram's Point, South 61° East; and No. 4, South 50° East. (You must keep a sharp lookout in going from the one to the other, in order to find out their place.)

No. 4 lies to the Southward, and close to the edge of the sand-banks, in 3 fathoms of water, with Bram's Point North 45° East. To the West of this buoy is a pit or hole with 3½ fathoms of water, and which affords a good anchorage for ships waiting for wind or tide. N.B. These bearings are by compass.

High-water. Every depth above given is at low-water, full and change of the moon, when the water rises 9 or 10 feet; but at the intervals only 5½ or 6 feet. It is high-water at 4h. 30m.

Light-house. A light-house is building on Bram's Point, in lat. 5° 56′ N., lon. 55° 9′ 30″ W.

Regarding the marks as above, the only additional caution necessary is against the setting of the tides; the flood sets with force upon the lee shore, and the ebb rushes straight over the sand-banks; the former is of some importance to ships working in, especially when the wind is not sufficient to keep the ship in restraint; for here the bottom, of a soft mud, has now and then, by suction, prevented the effect of the rudder: and as, in such cases, a ship may not always let go an anchor, they have been pressed deep in the mud, before they could do anything to prevent it. This happened, even in 1833, with one of the returning merchant-ships, which, passing the bank against the flood, touched but lightly; after which she ran till in 4 feet of water alongside, and although fortunately got off she lost her rudder, besides a great lapse of time, together with hard working and expenses. As vessels, small craft excepted,

always enter the river with the flood-tide, the effects of the ebb are to be shunned by those who come driving down the river; because the tide will throw them upon the sand-bank which juts out from Bram's Point. This bank, called Schulpe Rif (Shell-shoal) is of a tenacious substance, and nearly as hard as solid ground; therefore care should be taken not to be driven upon it.

Finally, no vessel of any considerable draught should enter the channel of Surinam without the certainty of going in at once, at least so far as to reach the anchorage West of the buoy No. 4; for getting aground here is always attended with some fatal consequence, during the following ebb-tide, which causes the ship to plough the soft ground till she is fairly driven ashore. If it be evening, or ebb-tide, you had better haul to the Northward, and must anchor when you have 3½ or 4 fathoms of water, with the outer vessel, (No. 1,) bearing S. by E. or S.S.E., as, should you lie to, the current would, during the night, drift you as far to the Westward as the River Saramacca; and many ships have been three to four weeks beating back to Bram's Point, although the distance is only 7 or 8 leagues. (It must however be remarked, they were probably unacquainted with the mode of working up along this coast.)

Having passed the buoy No. 4, you have only to keep in mid-channel with the lead going. A mile inward from Bram's Point stands a flagstaff, with a few houses, destined for a lazaret; here you may anchor in 3½ and 4 fathoms of water. Between this place and Jagtlust plantation, you will find the deepest water by keeping three-quarters over to the Eastern shore. After passing the first plantation called Resolutie, you will find only 2 fathoms at low-water, and from thence to within a mile of the entrance of the Comowinie may not be improperly termed the Lower Bar.

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 flagstaff, 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 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.

High-water. It is high-water, at full and change, at Bram's Point, at 4½ o'clock. The flood sets to the Westward, ebb to the Eastward.

Demerara. DEMERARA.—In sailing for the coast of Demerara from the Northward, you must keep well to windward, as the general set of the 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 Demerara to Berbice, or other ports to windward, exposes you to the general Westerly current, it is well to keep close inshore, and take advantage of the inshore tides; and should the winds be light it will be necessary to anchor with the flood.

Appearance of the land on the Demerara coast.—Nine miles to the Eastward of Cocobano Point are five or six single cocoanut-trees; 10 miles further 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 land.

Two Cotton Trees, S.S.W. 11'.

Vessels on the coast of British Guyana, and bound to Demerara, will clearly make these objects, as they alone alter the appearnce 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 Demerara 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 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.

Berbice. High-water. Light.

BERBICE.—Latitude and longitude of the light-vessel 6° 19′ 18″ N., 57° 22′ 30″ W.; high-water, full and change, 4h. 0m.

There is a fixed light at New Amsterdam, near the Palace of Justice, in lat. 6° 14′ N., long. 57° 22′ 40″.

Berbice light-vessel carries one fixed light by night, and a black ball at the foremast head by day, painted black outside and roofed over; she has a small jigger mast abaft, and lies in a quarter less than 3 fathoms, at low-water.

From the light-vessel to the entrance of the river the course is S.S.W., 10 miles. To enter the river all vessels have to pass over a bar or flat of 6 miles in extent, having 16 feet at high-water, and only 7 feet at low water, spring tides.

All vessels drawing from 11 to 15 feet, going up the river, should leave the light-vessel about an hour before high-water, and steer S.S.W. When about 2 miles from the light-vessel the water will shoal to 15 feet, until a tree on the low point to the Eastward, is shut in by a bluff point, bearing E. by S. ½ S. They will then be about 2 miles from the entrance of the river. The water will then deepen from 18 to 20 feet, and they will be over the bar. The channel narrows in approaching the river, there being a long mud-flat, extending about 6 miles to the Northward, on the Western side, which is sometimes dry at low water; and a hard shell-bank to the Eastward, on which the sea breaks at low-water, and which is steep close to. The channel lies between these two banks, and a vessel may keep so far to the Eastward as to shut in Crab Island half-way with the Eastern point of the river, and to the Westward, so as to open Crab Island from the Eastern point. When about three-quarters of a mile from the Eastern point, open the shipping between Crab Island and the Eastern point: and when off the East point, which is 5 miles from the town, steer South, or S. by W., in 3½ fathoms, keeping close to the Eastern shore, and about three-quarters of a cable's length off shore.

To avoid a shoal off the S.E. point of Crab Island, keep the steeples of the two churches touching each other, or about half a cable's length off the bushes on the Eastern shore.

Off Point Canje there is a mud-bank lying N. and S., of 30 fathoms in extent, having only 9 feet water on it, at low-water. It is half a cable's length off shore, and the mud on it is very soft.

After passing Canje Creek haul out a little to the Westward, in order to anchor with a flood-tide, and in 17 to 21 feet at high-water. Vessels drawing 12 feet generally lie aground here at low-water.

Berbice to Demerara.

BERBICE TO DEMERARA.—The true course and distance from Berbice light-vessel to Demerara light-vessel is N. 49° W. 51 miles; the magnetic course N. W. ¾ W.

Leaving Berbice with an ebb-tide, steer N.W. by N., by compass, 20 miles, and then N.W. by W., with which courses Demerara light-vessel will be seen ahead. The N.W. by N. course is to avoid the long mud-flat lying N.W. by W. from Berbice light-vessel, having at high-water only from 12 to 6 feet water on it; whereas this track will give from 16 to 20 feet, muddy bottom. To know when the vessel is to the Westward of this flat, two groups of trees, called the Eighteen and the Nineteen, will be touching each other, bearing S. by E. by compass. After the course then to N.W. by W. by compass, and in approaching the Demerara light-vessel there will

be from 18 to 26 and 30 feet water, muddy bottom. Twenty miles to the Eastward of Point Corrobana (the Eastern point of Demerara River) the coast assumes a more lively appearance, the mangrove-trees having frequent gaps in them, through which the smoke is seen rising from the different factories. There is also seen a very long remarkable group of trees, with large tops and small stems, called Paradise Plantations, with a white factory building half a mile to the Westward of it; and as there are no other trees on this coast having the same appearance, it will be a very good guide to know if a vessel is to the Eastward of Demerara, which frequently happens during the rainy seasons, when the current, which usually sets W.N.W., alters to N. by E. and N.N.E.

Ships coming from the Windward Islands and bound to Demerara, making these trees, and being in 5 or 6 fathoms water, by steering W.S.W., will make Demerara light-vessel; but they should not shoal the water to less than 3 fathoms.

DEMERARA.—Demerara light-vessel is in latitude 6° 59′ 30″ N., longitude 58° 5′ W. Time of high-water, at full and change, 4h. 30m. The light-vessel is painted red, has two masts, and carries a fixed light by night, and a broad red pendant by day, and lies in 4 fathoms at low-water, N.N.E. ½ E., 12 miles, from the light-house on Corrobana point. *Demerara.* *High-water.*

The light-house is striped red and white perpendicularly, and has a signal-post on the top of it. *Light.*

It is a fixed light, 103 feet above the sea, latitude 6° 49′ 20″ N., longitude 58° 11′ 20″ W.

Ships bound into the river have to pass over a bar, one mile in length and 1½ mile across, having 13, 12, and 8 feet on it at low-water. On leaving the light-vessel steer S.W. by S., or S.S.W. ½ W., allowing for the tide, keeping the light-house a little on the port bow, just over the cathead, for 8 miles. In this track there will be from 24 to 14 feet. When a single large tree, (the high cabbage-tree,) on the Western shore of the river bears S.W. ¼ W., or the Northernmost large factory chimney on the same side of the river bears S.W. ¼ S., steer S.W. ½ S., passing to the Northward of a black buoy and a staff, with a small cask on it, called the Tub Beacon; this track will afford 16, 18, and 20 feet water. It is not safe to shoal to less than 16 feet in passing the beacon, as the ground is very hard there. About W.S.W. of this beacon there is a white buoy in 16 feet, lying off the N.E. point of the river. Pass to the Northward of it, and between it and the red buoy, which lies N.W. from it about 1½ mile.

When the light-house bears S. by E. haul into the river, and moor off the town as most convenient.

In coming from the Northward, it should be carefully remembered, that the light in the light-house can be seen before that of the light-vessel. By bringing the former to bear S.W. by S. it will lead to the light-vessel; but if anything should have happened to the latter, and the light of the light-house be mistaken for it, when bearing anything to the Southward of S. by W., or Eastward of South, it would lead to a very hard sand-bank, having only 8 feet on it, lying W. and W.N.W. from the light-vessel.

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. Variation 5° 43 East. *High-water.*

The distance from George Town to the sand-hills up the river is about 25½ miles. 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.

SPANISH, or COLOMBIAN GUYANA.—The most remarkable feature of Spanish Guyana is the course of the River Orinoco. 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 Orinoco 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 Orinoco, 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. *Spanish or Colombian Guyana.*

The seven navigable channels into the river, already mentioned, are 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 Macareo, 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 1 foot 3 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 2 or 3 feet; but further to the N.W., towards and in the gulf of Paria, the tide rises 7, 8, and even 10 feet. Such is the effect of the configuration of the coast, and of the obstacles presented by the Boca del Dragou, &c.

Currents. The currents on the whole of this coast run from Cape Orange towards the Northwest; and the variations which the fresh waters of the Orinoco produce in the force of the general current, and in the transparency and the reflected color of the sea, rarely extend further than 3 or 4 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 Orinoco, 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 Orinoco 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 rinss. 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 Orinoco, 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 Orinoco. 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 until 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 information obtained on its banks, is much less regular in the periods of its oscillations than the Orinoco: 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 Orinoco 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 Orinoco have an influence on the Amazon; but those of the Amazon do not alter the progress of the oscillations of the Orinoco. It results from these data that, in the two basins of the Amazon and the Orinoco, 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 Orinoco. This river increases sensibly as 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 of the lower Orinoco. M. de Pons, who has, in general, collected very accurate notions during his stay at Caracas, 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 deposit 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., &c.]

The coast which extends from Cape North to the Great Mouth of the Orinoco, 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 means 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 5 leagues off; and the nature of the coast itself impedes a nearer approach than 2 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 5 or 6 leagues. Its latitude is 3° 5′ N. The soundings hereabout extend far out to sea. You may sail along the coast at 3 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 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 3 miles an hour. It flows at 6 o'clock on full and change days, and rises from 12 to 15 feet. *Tide*

The general velocity of the current, outside the influence of the tides, may be estimated at 2 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 Cachipour 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 Cachipour, 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 Cachipour, the river of that name disembogues itself.

Cape Orange may be known by a point (Punta Cortado,) 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. *Cape Orange.*

Beyond Cape Orange the coast forms a bay, of 4 leagues in breadth, in which the great River Oyapoc disembogues, 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 *River Oyapoc.*

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.

River Oyapoc. The River Oyapoc is 2 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 water close to the shore. After the Isla de Venados, there are some other small islands, which do not embarrass 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.

Apronague River. About 12 leagues to the N.W. from the River Oyapoc, is the River Apronague. Its entrance is 2 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, 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 2 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 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 to sea. Vessels bound to Cayenne direct their course to these islands from Cape Orange, from off which they bear N.N.W., distant 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 port hand.

N.N.W. from the Great Constable, there is a rocky shoal, which some place at 2, others at 3, and others even at 4 miles distant from it. To avoid this shoal is the principal reason for passing between the Constables; it 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 Apronague is Kaw River, and from it to the River Mahury is reckoned 4 leagues more. The River Mahury separates Cayenne on the East from the main-land. It has 3 fathoms, at low-water. The banks are pretty high, and covered with large trees.

Cayenne. CAYENNE.—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.

Light. There is a fixed light, 69 feet above the sea, on the infantry barracks at Cayenne, lat. 4° 56′ 12″ N., lon. 52° 13′ 4″ W.

At about 1½ league, 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 4 miles from the Father. You may pass without them at 3 miles, or a little less, 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 15 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 the 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 2 cables' length N.N.W. from its Western extremity.

Besides these isles there is another, at about 3 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 7 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 20 to 25 feet at low-water, clay bottom.

In general, vessels anchor to the E.N.E., N.E., or North of the Child, at the distance of 2 miles; but some anchor to the E.N.E. or N.E. of the Forlorn Hope, about 2 miles distant from it. From the East to the South of the 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 it has even less depth. In this place the tide rises 7 or 8 feet; and it is high-water, full and change, at 4h. 30m. *High-water.*

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 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. *Fresh water.*

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.

Five leagues N.W. from Cayenne is the River Macouria. The coast between is low, level, and has many handsome houses. At 10 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. *Macouria River.*

Twenty-two 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, Iracoubo, and Organabo disembogue themselves, and shoals and banks of clay stretch out about 3 leagues to sea along the whole of it; so that it is necessary to keep at least 4 leagues from the land, in 5 or 6 fathoms of water. Between Cayenne and Maroni there are many single or detached rocks, some of which are 2 leagues from the shore. *River Sinamari.*

From the River Maroni to Surinam River, the distance is about 24 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 4 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. *River Maroni.* *Beacon.*

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 3 leagues, anchoring then in 3½ 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 2½ fathoms. 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. *Tides.*

At one league up the River Surinam the River Comowinie discharges its waters into it. A little further up is the bar, upon which there are not more than two fath- *River Surinam.*

oms at low-water. After passing this, you find, on the West shore, the town of Paramaribo.

River Saramaca. Four leagues West of the River Surinam the Rivers Saramaca and Copename enter the sea by the same mouth. Their banks are uninhabited, and in their mouths are 2 fathoms at low-water.

River Corentine. Ten leagues West from these rivers, the River Corentine disembogues. Its entrance is about a league in width, but of difficult access, on account of the sand-banks off it, which extend 3 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.

River Berbice. 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 Demerara have already been fully given.]

River Essequibo. The River Essequibo is very large. Its mouth is 3 miles wide, but full of islands and shoals which 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 2 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.

River Pauroma. 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 town or village, named Middleburgh.

Coco Point. 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 but mangroves.

From Coco Point you steer N.W. and N.N.W., with the precaution of keeping in 5 or 6 fathoms of water, in order to avoid 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

River Guayama. 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 Orinoco, 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 Orinoco. RIVER ORINOCO.—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 Orinoco, 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 Orinoco discharge their waters. They are fit for small vessels only, which have pilots, because they are full of dangerous sand-banks.

North of Point Barma, in 18 feet water, there is a light-vessel, on board of which pilots are stationed for the river; the light can be seen 9 or 10 miles in clear weather, lat. 8° 37′ N., long. 60° 40′ W. *Light-vessel*

GRAND MOUTH of the RIVER ORINOCO.—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; 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 increase 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 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 you up the river. A pilot may be engaged from any of the small vessels of the country. *Grand Mouth of the River Orinoco.*

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. At one-third ebb, at the rising of the moon, the water of the Orinoco 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 further 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, *Tides.*

The magnetic variation, at the mouth of the river, is 4° E.

The termination of this coast may be fixed at the Grand Mouth of the Orinoco, which we have described; and we now proceed to make some general remarks which follow:

GENERAL REMARKS ON THE COAST OF GUYANA.—It is necessary to remark, 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 of the rivers; and what renders this more necessary is, that in the season of the rains there are often days on which the latitude cannot be observed. *General Remarks on the Coast of Guyana.*

If such is the uncertainty as to recognizing the points, it is no less in respect of the soundings at the entrances of the rivers. All these rivers form bars, and 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.

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.

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 limit, as at that distance out at sea no other current than the general one is felt; but

Tides.

between that and the land no other currents than those caused by the tides are felt. It is high-water, full and change, at Cayenne and at Surinam, at 4h. 30m.

In addition to what has already been said, it is advisable for vessels bound 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 fatal to the 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.

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 port 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 port tack; but in such cases it is very necessary to be extremely careful with the lead. When night comes on, and you are near 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.

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 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.

The islands of Ramire, the Constables, and the Health Islands, are the only points of this coast which are likely to cause the loss of a vessel, if she 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 3 leagues from them, or to pass outside of them, taking care to give the shoal, of which we have already spoken, a sufficient berth.

On the whole of this coast there are no other harbors than those formed by the mouths of the 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 obtain a sufficient practical knowledge of the place by means of your boats, so as to be able to take the vessel in safely yourself.

When any one wants to beat to windward on this coast, or what is the same, wishes to go from the Orinoco, 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.

Those who, from the Antillas, are bound to any port in Guyana, ought to keep their port 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 Orinoco, even the most experienced are unable to ascertain the places where they find themselves; and without the assistance of observation for latitude, and of prudent conjectures on the different appearances to windward and leeward, they would often commit very serious mistakes.

The environs of Demerara 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 until you can clear up your doubts; as, although you lose time, 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.

Dead Reckoning.

DEAD RECKONING *in shoal water 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.

VESSELS bound to the coast of South America, South of Cape St. Roque, should endeavor to cross the equator as near the long. of 30° W. as may be, as experience has shown that that is about the best point to avoid falling to leeward. The island of St. Paul's, being near that route, we give its position and description.

St. Paul's Islets.

ST. PAUL'S ISLETS are in lat. 0° 55′ 30″ N., long. 29° 22′ 30″ W. They appear extremely small at the distance of 8 miles, and are covered with multitudes of birds. Numbers of fine fish, like the garoupas of the Bermuda Islands, may be caught with hook and line. The highest point is 64 feet above the sea. The variation, in 1832, was 9½° W.

Fernando Noronha.

FERNANDO NORONHA consists of one large and several smaller islands. It is hilly and uneven land, and may be seen 10 leagues in clear weather. The principal island has on it a high rocky peak, called the Pyramid, which is very remarkable, and seems to lean to the Eastward when it bears S.S.W. The S.W. point has off it a sunken rock at a considerable distance, which renders it dangerous to approach. A reef and some sunken rocks extend off the S.E. part, at about 3 miles from the shore. There is a reef, on which the sea breaks, about 3 miles off the East part of the island, with a channel of 10 to 15 fathoms inside. The Pyramid shut in with the highest hill leads directly upon it.

The group lies N.E. and S.W., about 7 miles, and is nearly 2 miles broad.

Tide.

Wood and water may be obtained here, (the latter not at all times,) but are difficult to get off, on account of the heavy surf. It is high-tide, at full and change, at 4 o'clock. Rise of tides 8 feet. Variation 7° W. The Pyramid is in latitude 3° 55′ 8″, long. 32° 25″ W.

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.

THE ROCCAS.—These are dangerous low keys to the Westward of Fernando Noronha. 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 there is a high rock, and the sea breaks exceedingly high all around them. At 2 miles to the Westward of the reef there is bottom at 28 fathoms, coral rock. The current here sets 2½ miles hourly to the Westward. Rise and fall of tide 6 feet. Latitude 3° 50′ 54″ S., and longitude 33° 48′ 39″ W; variation, 10° 56′ W.

Tide.

Coast of Brazil.

COAST OF BRAZIL.—The appearance of the coast of Brazil is very various. 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 distant, 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; in short, everywhere between Olinda and the island of Maranham: in all these places the land is more or less low, few mountains can be perceived, being too far in the interior.

Sounding in general is of very little service to indicate the distance from the land, particularly from Santa Catharina Island up to Olinda Point, 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

Depth of the Sea.

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 Joatinga Point; 77 fathoms at 18 leagues South-east of Rio Janeiro entrance; 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. ¼ S. of Cape St. Thomas, you cannot find bottom 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,) a less depth than 100 fathoms is not to be had at 30 leagues from the coast.

No bottom is to be had with 200 fathoms 8 leagues 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 there is no bottom with 120 fathoms, at 9 leagues distant. From Bahia to Olinda the coast is not less bold, for at 9 leagues East of Torre de Gracia de Avila there are over 180 fathoms; at the same distance 9 leagues East of the bar of Itapierucu, 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, everywhere 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 with over 120 fathoms. Though the soundings are less North of Olinda, they are too great at a small distance to be of service.

North of Cape St. Roque, the land being more low and extending into the sea, the soundings decrease gradually towards the shore.

From Monte Malancia up to the village of Amufadas, there are but 15 fathoms at 16 leagues distant, and further 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 2 4to 25 feet only of water are to be met with, over an extent of 3 leagues, but it is the only place up to Maranham.

The coast of Brazil has this peculiarity, 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 others forms breakers or shallow waters. The other bank, further distant from the shore, is not equally distant anywhere. It cannot be stated as forming shallow water, but 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 dry season is from September to February; the rainy season 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; but at a short distance from the shore the monsoon is not so regular: 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 are said to arise from a white cloud of a round shape, and of a little appearance at first, increasing to such a force as to be dreadful.

Land-breezes are very regular on the whole extent of Brazil coast, but not equally so, being 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 directon as the sea-breeze, this part coming from the S.W.

As a general rule the land-breeze will be more powerful in proportion as the sea-breeze is so.

Generally, the more you proceed South along the coast, the more you must expect to find the winds 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 will be powerful in general. They last in proportion to their strength: the stronger the shorter. When they turn into a hurricane,

they will never last over 24 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 in 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 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 unnecessary 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.

A revolving light, twice white and once red every 3 minutes, has been erected at the entrance of Pernambuco, on the reef, by which that part of the coast may be recognized. *Light-house.*

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 for 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 20 miles further, and it is only at Calcanar Point that it changes its course to N.N.W. *The Cape and Banks of St. Roque*

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, states 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 draught 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 well to keep at a distance from it.

The Eastern breaker lies 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, is 12 miles N.E. ¼ N. 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 everywhere, and we found it always a mixture of white madrepores and sand, and in some instances 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. *Tide.*

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; *Cape Petetinga.*

and at about a musket-shot from shore is a high reef, near which you may anchor in 3 or 4 fathoms, 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 de 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.

Point of Rocks.

Off the Ponta das Pedras are three shoals of rocks, having a channel between them and the main of 3 and 4 fathoms. At 3 leagues outward are reefs above water.

River Guamare.

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 Amargos, 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. The point may be known by its high red cliffs; and hereabout were, and probably still are, some palm or cocoa-trees.

Salt Ponds.

River Upanema.

At the River Upanema 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 red cliffs. Further inland is Monte Vermelhos, a sugar-loaf hill. Ships, however, should not advance into the bay, as it is full of shallows.

River Iaguaripe.

From the River Upanema to the N.W., the next river of 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 by a mountain inland 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 3 leagues from the River Iaguaripe, the land for nearly 4 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 9 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.

The bay of Iaguaripe to the South-eastward of Ciara, 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 2½ or 3 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, 3 leagues out to sea, is a shallow of green water, of 5 to 7 fathoms, with bottom of mixed sand, and, in some places, small shells.

River Xaro.

Ciara.
Light.

CIARA is the most important town upon this part of the coast. The bay on which it stands is formed by Point Macoripe (on which there is a fixed light, 37 feet above the surface of the sea, in lat. 3° 41′ S., and long. 38° 29′ W.) to the 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.

Directions for good anchorage off Ciara.

Get the light-house on Macoripe Point to bear S.E. by E., and stand on this course until the church steeple is in one with a notch in the West end of the ridge of the mountain in the interior, at which time it will bear S.W. by S. Keeping this bearing, run in on this course, until in 6 or 5 fathoms water, where anchor, and wait for the pilot to take the vessel inside the reef. The anchorage outside is good holding-ground, and perfectly safe, inasmuch as there seldom or never occurs a gale here. Should this port be made at night, there will be no difficulty in anchoring in perfect safety with the light-house on the above bearing, in from 8 to 5 fathoms. The light is a very inferior one. Inside the reefs, 3½ fathoms; between them, is the least water at high-tide. Ordinary rise 3 feet.

Tide.

All communication with the shore is had by means of *jangadas*.

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 a point which has a tower near the extremity. Ships advancing from the N.E. should not approach the point nearer than 3 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 Ciara S., about 4 miles distant from shore, in 5 fathoms, sand and mud.

The 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 flagstaff.

North-eastward of Ciara, 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.

The inner anchorage, above mentioned, is between the 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 Ciara 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 Ciara ; 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 Ciara, 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 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 easy distinguishable from the coast between Parnahiba and Green Mangues (Mangrove) Point, which consists of nothing but sand, without the least sign of vegetation.

Tutoia.

The bar of Tutoia is between 7 and 8 miles wide, and may be crossed at all times with 15 feet water.

The bars of Iguarrassu and Barra Velha are not navigable. Tutoia, above mentioned, is the only port accessible, and is highly important in a commercial point of view.

River Perguicas.

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 land 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 23 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 Rocks. ANGERSTEIN ROCKS.—Lat. 4° 28′ S., long. 37° 6′ W., sounding 11 feet.

They are not dangerous by day, being of a dark brown color, so that 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.

St. Marco Bay. 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 72 miles, and its width 6 miles; everywhere the depth of water is sufficient for large vessels, even frigates, which may cast anchor near the harbor of St. Louis, 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.

Lancoe Grandes. 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 Perguicas, 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 will 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 the 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 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 are beyond this cape you may cast anchor.

Maranham Beacon Light. MARANHAM BEACON is a fixed light on Fort St. Marcos, which can be seen 15 miles. It is placed to avoid the dangerous bank Do Meyo. From it the West edge of the bank bears N. 27° 30′ E., and the East edge N. 63° E. The light should not be run for between the opposite of these bearings.

Shoal of Manoel Luiz. 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.

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 half a mile, it is probable you will not see one trace of this danger, if the sea is calm.

The survey 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 we had not the opportunity of making the examination. These rocks are in latitude 0° 51′ 25″ S., longitude 44° 14′ 45″ W., and the variation was 0° 57′ E. The rise of the tide was 12 feet, and it was high-water at 5 o'clock; the flood ran for 6 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. *Tide.*

We were told that another group of rocks had been discovered nearly 7 leagues more to the Northward, and almost in the same meridian. The position given to this new danger is latitude 0° 32′ S., longitude 44° 17′ 21″ W., and there does not appear to be any doubt at least of their latitude.

It is 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 further 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.

MARANHAM.—A light is erected on Mount Itacolomi, on the Western side of the bay of Maranham, 147 feet above high-water. It is a revolving light of two distinct colors, white and red every minute, and lies in latitude 2° 10′ S., longitude 44° 24′ W. of Greenwich. *Maranham. Light.*

Vessels bound to Maranham may cross the equator in longitude 40° W., which will enable them to fetch the Lancoes Grandes. 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 light, and not having sufficient daylight to find her way into the bay of St. Mark, may lie to for the night, keeping the light as near South of her as possible, distant 6 and 7 miles. The light is revolving, time of revolution 40 seconds, and can be seen about 15 miles. *Light-house.*

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 flagstaff of St. Mark's are made out nearly ahead. St. Mark's Point should not be passed at a greater distance than 1½ mile, 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, so very dangerous to strangers.

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 that prevail in this season; and also the current, which sets from E.N.E. to S.E., about 2 or 3 *Route from Maranham to Para.*

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 Salina, 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 Salinas 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.

A flag hoisted on the flagstaff at Salinas village, is the day-signal that a pilot may be obtained.

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.

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 5 or 6 fathoms water, when Point Atalaia will be distant about 5 miles. You may 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 anywhere upon the beach.

High-water. The boat should be sent at half-flood, in order that it may return the same tide. It is high-water, full and change, at 7 o'clock, and off shore at 8.

Light. On Point Atalaia there is a revolving light, (Fresnel,) of 70 seconds of light and an eclipse of 16 seconds, then 12 seconds of very brilliant light succeeded by an eclipse of 22 seconds ; this is repeated every 2 minutes.

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. They should 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. 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. A vessel bound from Maranham to Para, should take her departure in the morning, run 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 one degree South.

The island of St. Joao is nearly level with the sea, and about 3 leagues from E.N.E to W.S.W. Between the N.E. end of this island and Point Tamandua, to the W.N.W., the distance is about 9 leagues. The bay between affords shelter, and vessels may anchor at 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 Tamandua Point is Cape Gurupi, 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 or 6 fathoms water, and good ground. *Point Atalaia.*

RIO PARA.—Point Tijoca, 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 the shore between the two points, and to the Northward are the Tijoca 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, in a depth of 12, 11, and 15 fathoms, at about 11 miles from the Southern shore, in lat. 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 Tijoca, as already noticed. *Rio Para.*

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 be seen 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 a boat on shore for one. *Directions for Para.*

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 passsing the shoals, or getting up the river.

The land between Salinas and Tijoca 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 Tijoca, and a good departure to run between the shoals. Tijoca 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 Tijoca, 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, 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 Tijoca, 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 anywhere about that part of the coast. Haul off as soon as possible to the South and East, to avoid the Braganza 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.

A flagstaff 40 feet in height has been placed 58 fathoms E.N.E. of the light-house, where the signals will be made with seven different flags, as follows: *Signals.*

No. 1. A red flag, with white swallow-tail, signifies to vessels arriving at Salinas that a pilot is there, and a boat to take him on board.

No. 2. A white flag, with a blue cross through it, signifies that the pilot goes on board immediately.

No. 3. A flag, upper half red, lower half white, signifies that the tide will not allow the pilot to embark.

No. 4. A flag, all blue, signifies that the pilot will go on board before noon.

No. 5. A flag, inner half white, outer half red, signifies that the pilot will go after noon.

No. 6. A flag, blue and white chekered, signifies that the pilot will go on board before midnight.

No. 7. A flag, red and white chekered, signifies that the pilot will go on board after midnight.

When a bonfire is seen in the village of Salinas, it signifies that there is a pilot, and a boat to take him on board as soon as the tide will allow. When two bonfires are seen, it is a signal that there is a pilot but no boat to take him on board. When no bonfire is seen during the night in the village, the vessel having appeared during the day, it signifies that there is no pilot at the station.

Vessels wishing a pilot, should hoist a red flag at either the fore or mainmast head, but never at the peak.

When it is known by the signals made on shore that the tide will not allow the pilot to go off, vessels not wishing to anchor in 6 or 7 fathoms, keeping the light-house bearing South-east, should lie off and on, standing out during the flood and in shore during the ebb tide.

Vessels being North-west from the light can receive pilots more promptly than in any other position. The pilots embark at high-water, which, at the full and change of the moon, is, on the coast, at 30 minutes past 7, (7h. 30m.) and at the place where the vessel should anchor, 15 minutes past 8 o'clock, (8h. 15m.)

Masters of vessels need pay no attention to signals hoisted at Salinas, as they are merely made for the information of the keeper of the light, who also has charge of the signals.

Channel between Tijoca and Braganza Banks.

THE CHANNEL BETWEEN TIJOCA AND BRAGANZA BANKS.—When you make Tijoca 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 Braganza breakers from aloft, which break very high on the port 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. The ripple caused by the tide appears to a stranger like shoal-water, where there are probably from 14 to 15 fathoms water: and while the Braganza 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 Tijoca Point bears about S.E. by S., Braganza distant about 2 or 3 miles, you may haul up about S.W. to avoid Tijoca 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 Braganza 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 Tijoca 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, to the South of which, abreast of Point Taiper, is good anchorage, in about 7 or 8 fathoms water. This 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.

Point Taiper is about 11 miles from Tijoca 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 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, 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. When you pass Colares, your water will deepen very soon after as you approach the Bay de Sol, which will open to your view. Bay de Sol is a large deep bay, being about 5 miles wide at the entrance.

Bay de Sol.

Be careful not to 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 Sol, where you will have from 16 to 18 and 20 fathoms water, which is not the case anywhere else in the river. Colares bearing East about 5 miles, steer from S.S W. to S.S.W. ½ W. You will then pass two small islands on your port hand, one abreast of the land, which forms the Bay de Sol, (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 2 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. When you pass Point Penheiro steer directly for the fort, which stands on a small island, giving it a berth of half a cable's length on the port 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 port 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 Sol, distant 7 or 8 miles.

High-water.

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 Tijoca, 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 15 or 16 miles. With Cape Magoari 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 Magoari 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.

Pernambuco Bay.

PERNAMBUCO BAY.—Cape St. Antonio is the land which 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 2 to 4 miles distance, there are 12 to 10 fathoms water.

Pernambuco light.

PERNAMBUCO LIGHT is a revolving light, on the reef forming the South point of the entrance of the port. It is composed of three lights, two white and one red, which show alternately, and revolve once in three minutes. It is visible 18 miles.

When you have made Cape St. Antonio, you must keep at 2 or 3 miles from the shore, until you bring the fort of Picao to bear between N.W. and W.N.W., and then run for the fort built on the breakers, until the cocoa-tree of Olinda (which stands between the two highest buildings of the city) bears N. ½ E.; keep on this course to within two or three thousand yards of the breakers, which form a key. The anchorage is not very good, large ships ought never to go nearer, and it is prudent never to anchor, in bad weather, West of the meridian of the cocoa-tree of Olinda. 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 2 miles from the shore towards the sea, which makes it necessary to keep at 3 miles distance, and in from 8 to 10 fathoms, until 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 further South than the parallel of Fort Ciesco. The sea breaks there with great violence in heavy winds, 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 such vessels should not draw over 5 feet, and a pilot is indispensable.

The white can Olinda buoy is moored in 5 fathoms at low-water, at about 2 miles E.S.E. of Olinda Point, with the following approximate bearings :—Sé church tower, W.N.W. ¼ N. ; the flagstaff of Fort Buraco, W. by S. ½ S. ; and the tower of the naval arsenal in Pernambuco, S.W. by W. In clear weather it may be seen at from 5 to 6 miles distance.

Buoys. On the English Bank there are two buoys, a red one on the Southern end and a black one on the Northern end.

South of the red buoy there is plenty of water for any vessel. North of the black buoy should not be attempted without a pilot.

The harbor of Pernambuco is not a very safe one, 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 should the wind turn S.S.E or E.N.E., as is the case in the months 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 it is requisite to make use of chain-cables in this place more than in any other. Large vessels will do well to be at all times in readiness to get under sail, and prudence requires 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 moor with two anchors to the Eastward, and another toward the W.N.W., over the stern, 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 draught of water ; it is divided into two parts : the interior part, which is called the Poco, (the Well,) is 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 insufficient for that purpose, and during the Southern monsoon this place is not at all safe. The second part 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, but the bar has but 7 feet at low-water.

If you wish to enter the Poco Harbor, you must proceed as follows : being inside of the English Bank, the cocoa-tree of Olinda N. ½ E. of you, you will have a small pyramid on the shore, in range with the church of San Amarao, which is surrounded with cocoa-trees, and you must run for them until Fort Picao bears South. If you wish to go into Mosqueirao you must steer S. ½ W. from that place.

Small vessels sometimes pass through the South entrance to Mosqueirao, which is at the Northern end of the quay of rocks whereon Fort Picao is built. The mark is, to keep the two corner-towers of the Southern end of Fort Brain in range, and run for them, true West, until Fort Picao bears South ; then steer along the Western side of the breakers into the harbor. There is no great danger in going near the breakers ; it is customary with pilots, when called, to come to vessels lying in the bay. 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 swell of the sea by the breakers, or quay of rocks.

The prevalent winds are from S.S.E. to N.N.E. ; from March to September, they are more towards the South, and sometimes S.W. ; during the other six months they stand E.N.E. and N.N.E.

Bahia to St. Augustine. THE COAST FROM BAHIA TO ST. AUGUSTINE.—From Itapuanzinho Point up to Itapuan, the shore is sandy and low ; a few trees are to be perceived at a distance, and from place to place some cocoa-trees. All along shore are ridges of rocks, 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 further 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, 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. From Torre of Avila up to Oiteras of San Miguel, the shore is higher, 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 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 after Rio Real is Rio Sergipe, which is 21 miles distant from Vassa Barris. The mouth of this river, when viewed at a small distance, is distinguished by the three small hills of equal height, covered with briers, 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, presenting a marked contrast with the green coast all around. At the bar the sea breaks with great force, from which we infer there is shallow water. The rivers next in succession are: Colindiba River, near the Miserais Point and Japaratuba Points, South of the mountains of Pacatuba. There are but 7 feet of water at the bar. When the bar bears W., the Mount Aracajou bears a few leagues N.W., and in the West Morro Telha is discovered. The Mount Aracajou runs parallel with the coast, and in its Northern extremity there is a deep cut. The second mount has the shape of a Quaker's hat.

COLINDIBA RIVER.—Vessels bound to the Colindiba River during the Northerly monsoon, viz., from March to September, should make the land in the latitude 10° 50′. Mount Aracajou will be about West, and will appear near the shore. Steer S.W. along the shore in no less than 5 fathoms, and the Atalaia will soon be seen, and if the flag is set, it will be a proper time to pass the bar; and a flag will be put out North or South as it may be necessary to steer. Sometimes the pilots come outside the bar, but not at all times. When the flag is set on the Atalaia, the pilots will be in readiness on or within the bar. *Colindiba River.*

The Atalaia on with Mount Cajaiba will lead to the channel over the bar. Course N.W. by W. ½ W., or W.N.W.

If in the Southerly monsoon, it will be well to make the land in latitude 11° 2′; the Three Brothers will then be seen thus ⌒ ⌒ ⌒, and Mount Aracajou to the Northward, like a promontory; no land to be seen beyond it. Steer along shore Northeasterly, in not less than 4 or 5 fathoms, and the Atalaia will soon be seen, when you can steer in as directed above.

The Atalaia has the appearance of a tower with a flat top and flagstaff in the centre, but is nothing more than four large spars put upright, and secured with rafters or beams, some 10 or 15 feet apart; some boards are nailed at the top, which makes it look white when the sun is on it. Steer direct for the flags.

If clear, Mount Itabayanna can be seen 30 miles, and Aracajou 12 or 15, the Atalaia 3 to 5 miles. There is usually a small nun buoy on the South sand-head.

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 being too hard for the anchor to hold.

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 in making the land here. 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 that direction, there are dangerous breakers. The North point of the entrance is much lower than the former, of white sand, and there are extending from it dangerous breakers. Between these breakers you must anchor until a pilot comes on the bar. There are from 12 to 13 feet water; the land from St. Francisco River up to Alagoas is low and sandy, and a ridge of rocks, at a short 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, 3 miles distant from the shore, stands the rock of Dom Rodrigo. All around this place there is a great depth of water, and the shallow water does not extend over 3 miles. As there is no reason to keep near the land, one will do better to remain at a greater distance than 4 miles. 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 South, the village of Macayo will be seen 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 breakers are to be seen at some distance in its direction. North of Macayo, and from the interior, the mount of Marambaya may be seen at 45 mile

distance. 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 port 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 large vessels.

Nine miles N. ¼ 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 two rocks, Alexo, are in range, they bear N. 6° W. North of these two rocks, Monte Do Sella is seen in the interior, which derives its name from its shape, (Little Saddle.)

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 a moderate height, which decreases gradually towards the sea. A steep beach of a red yellow color. is to be seen in many places upon it; on its top there is a church: towards the North side, a little below the church, fortifications are to be seen.

The Bay of All Saints, or Bahia.

THE BAY OF ALL SAINTS, OR BAHIA.—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 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 distance from Cape St. Antonio to Itaparica Island is not less than 4 miles: but 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 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 parallel with 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 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 steer towards Cape St. Antonio until 2 miles only from the shore; from thence steer for the church of Bom Fim (situated on the point of Montferrate,) until up with 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, is easily avoided, and is 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 everywhere according to the statements of the natives; but as in some places the sea breaks on this bank during strong wind, large ships should keep at a distance. which is the case when following the course we have described. The 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 has on it 3 to 3½ fathoms only, lying W. ¼ N. from Fort Do Mar.

Generally 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 making short tacks. 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 have equal times. The harbor is very safe, and there are only a few instances, when a strong wind from the S.W. blows, that the water is much swelled, and ships do not ride easy.

Tides.

The course out of St. Salvador is very near the reverse to the one in. When one mile distant West of Cape St. Antonio, by steering 4½ miles S.S.W., 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, compared to those on 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 30 miles distant. On the end of Cape St. Antonio stands a light-house, containing a brilliant revolving light, showing two white sides and one red, the latter to be seen once in every 4 minutes, situate on Fort Santo Antonio da Barra, 140 feet above the level of the sea, and 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 point. on the top of which stand the poles for sig-

Light-house.

nals. This last point forms, with the Itapuanzinho Point, which stands one mile East, a small bay. Many houses are to be seen along the sea-coast.

MARTIN VAS' ROCKS are high and barren; the central one is the largest, and may be seen from a ship's deck at 3 leagues distance: this is a little more Easterly than the other two, although they are nearly on the same meridian, as they are in range when bearing S. Between the central and Southern rocks there is a channel. With the largest rocks E.N.E., about one mile distant, you will have 12 fathoms. Plenty of rock-cod and other fish may be caught here. N.E. from the largest rock, about 2½ miles distant, there is a sunken rock, on which it usually breaks. Their extent from North to South is 3 miles. They are all steep and inaccessible. The channel between them and the island of Trinidad is about 25 miles wide. The largest rock is in lat. 20° 29′ S., long. 28° 54′ W. *Martin Vas' Rocks.*

TRINIDAD ISLAND is about 6 miles in circumference, and lies N.W. and S.E., nearly. The S.E. point is in lat. 20° 31′ S., long. 29° 21′ W. The island is high and uneven, and may be seen from a ship's deck about 17 leagues. In some parts, particularly the Southern part, there are trees from 12 to 18 inches in diameter, but it is mostly barren. The surf continually breaks upon it, rendering landing difficult and dangerous. On the West side there is a rock with a stupendous arch, like that of Fernando Noronha, and a very remarkable rock called the Monument, or Ninepin, which is 850 feet high, and almost detached from the island, with large trees on its top. At the S.E. end of the island is the Sugar-loaf, a large conical rock, 1160 feet high, with trees on its summit. *Trinidad Island.*

The Coast between Rio Janeiro and the Bay of All Saints, the Harbor of Espirito Santo, Porto Seguiro, &c., &c.

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 further, N. 77° E. of these islands, you meet Cape Negro, which is formed by a hill not very high, adjoining the highest mountains between Rio Janeiro and Cape Frio, which, with its dark green tinge, 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 afterwards 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 may be seen at some distance from the 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. At no great distance from the shore a ridge of rocks and sand are to be seen at low-water, with 30 and 40 fathoms water, 6 miles distant, muddy bottom, the depth increasing very fast towards the sea, and at 10 leagues 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 towards the land. The bottom is a mixture of coarse sand, gravel, broken shells, rocks, and mud.

CAPE FRIO (on which there is a light-house, with a revolving light, 1000 feet above the sea, which is visible 2 minutes and eclipsed 2 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 green grass is nowhere to be seen. In fine weather it may be discovered 15 leagues distant. Viewed from E. and N., two hills are visible 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 N.N.E. and S.S.E., those two hills appear to be but one with two 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 everywhere mud. *Cape Frio. Light-house.*

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 everywhere more than sufficient. The Northern passage is very spacious and safe against any wind except N.E.; but by anchoring more North

towards the Island Dos Porcos, you will be perfectly safe, the anchorage being firm, and often resorted to by coasting-traders. Variation 2° 3′ E.

The Northern part of the coast of Cape Frio, together with the islands, runs N. 35° E. up to the Anchora Islands, and forms a deep bay, in the inside of which stand the numerous islands of Papagoros: several of them afford very safe anchorage in case of contrary wind.

The islands of Anchoros are 4 miles E. ½ S. from Cape Busios; the Eastern one has the appearance of a Quaker's hat.

North of Cape Busios lies the small island of Branoa, from whence another beach extends to the Morro San Joa, 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 distant from the shore, lies the island of Santa Anna.

The Morro San Joam is easily distinguished, being entirely separated from the chain of mountains lying in its rear.

At 20 miles N. ½ W. of Morro San Joam is another hill, the Northern side of which is quite perpendicularly cut, and its top ends in a sharp point. It is known by the name of Father de Macaya, or Macahe.

The islands of St. Ann are three in number. Viewed from the 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 4 to 5 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 islands of St. Ann up to Benevente, which lies in latitude 20° 53′ 50″ S., a flat land projects considerably into the sea, and is known by the name of Granes.

Cape Thomas. 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 13 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 into the sea, and forms what are called the Banks of Cape Thomas. At the distance of 5 miles are from 10 to 21 fathoms, increasing regularly towards the sea. By keeping 15 miles from the shore there is not the least danger.

Some coasting-traders state that places on the banks are to be met with having 2 or 3 fathoms of water only, but the pilot thinks differently.

The bottom near Cape Thomas is not mud, 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 further 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 enters 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 everywhere 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 to the South or North.

Espirito Santo. 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 further distant the Pocates 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, and is of a conical shape, covered in part with wood; no green grass to be seen on its Eastern side: it may be discovered 10 leagues distant. Vessels going up the river must range along it at no great distance. The two Pacotes Rocks lie 2½ miles off, 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. The hill called Mastre Alvaro, is distin-

guished by its great height on a low ground, appearing 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. Through the space between this island and the mountain, a vessel not drawing over 16 feet water may easily pass without danger, as you will not have less than 18 feet water.

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 had in plenty and cheap. The climate is unhealthy, being extremely damp. There is a rock called the Pao de Hanuar, (Sugar-loaf,) about 2000 yards from the city; 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 except inside the bay.

The coast North of Espirito Santo is low and covered with trees; and the shore which runs N. 32° E. from the Tuberon, (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 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 Tabarao End up to San Matheo, may be approached everywhere at the distance of 2 or 3 miles. From 9 to 10 fathoms water are to be found at that 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.

The bar of Rio Seca lies 10 leagues North of Rio Doce. Rio Seca is a stream only in the rainy season.

The bar of San Matheo is 10 leagues distant from Rio Seca. This bar may be distinguished at a great distance by the breakers, which are greater than on the surrounding places. The shallowness of the water, the impossibility of crossing 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 18 to 20 leagues, and East and West not less than 20 leagues: and though the whole extent is not equally dangerous, yet a vessel not bound to this place, will do well to keep away from it. *Abrolhos.*

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, 20 miles.

Nothing is to be found on these islands except some reeds and cactus. Numerous tribes of birds inhabit them. A few turtles are to be met with. Fishes are 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.

We have already stated that the extent assigned to the shallow water is not everywhere dangerous. In the same extent, it appears that from the E.S.E. up to S. by N., and W., large ships may approach from one to eight 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 not over three-tenths of a mile an hour. The soundings show no mud over the whole extent of the shallow water of Abrolhos, and if any is to be perceived, it is a certain sign you 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 a N. E. direction. In the direction of S.S.W. or N.E. by N., 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 certain information respecting the Paredes, which are placed in the chart according to the statements of the native mariners, beginning at the bar of Portalegra, and ending at Alcobaca.

Capt. Fitzroy, of H. M. sloop Beagle, on the Abrolhos Banks.

"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 sounding frequently, and taking good observations.

"Having reached the parallel of the islands, 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 slightest 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 Rouissin, 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 4 or 5 fathoms under one side of the vessel, and from 15 to 20 under the other side. The *sauts de sonde*, as the French express it, are surprising.

"The tide, or rather current, which we experienced, was continually to the Southward for the three days we were near these islands, varying from half a mile to 1½ mile 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 deposit 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 4 to 5 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 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."

Hotspur and Victoria Banks.

HOTSPUR AND VICTORIA BANKS.—The Hotspur is about 15 by 10 miles across, in lat. 17° 51′ S., long. 36° 59′ W., variation 6° 33′ W.; and the other 72 miles by 12, the middle of which is situated in lat. 20° 46′ S., long. 37° 47′ W.

No bottom at 200 fathoms has been found between them, nor between them and the coast, from which the nearest is 180 miles.

Montague Shoal.

THE MONTAGUE SHOAL is in lat. 20° 45′ 8″ S., long. 37° 47′ 23″ W., with one spot at its N.E. extreme of only 19 fathoms; the current sets to the S.W. three-quarters of a mile per hour. The same description of fish as on the Hotspur may be found on it in abundance. The variation is 3° 42′ W.

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 3 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. This dangerous place is called the Itacalomis, 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 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 towards Porto Securo, the shore is more high and steep, and the cow-tree is more numerous amongst the trees which cover the land. In 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 2 miles from Porto Securo; the walls of that church being perfectly white, it is perceived among the trees at some distance. There is a small river that 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 is 12 leagues; the coast runs N. 14° E., very woody; sandy banks and shallow water are to be found at 3 miles distance.

From Belmonte to Fort St. George dos Ilheos is 20 leagues, steep shore and equally woody; depth of water from 7 to 20 fathoms; and at 5 miles distance, muddy bottom and broken madrepore. At half the distance from Belmonte to Fort St. George, you will see the Seras de Itaraca, a group of mountains on which terminates the flat country beginning after Mount Pascal; the Southern mountain is named Commandatuba.

From Fort St. George, up the two Castelhanos Ends, 19 leagues distance, the coast is perfectly safe; the largest ships may approach it within 2 miles.

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. 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 until you arrive at Cape or Morro San Paulo.

Morro San Paulo, from the East end of the bar of Uha's River, may be easily distinguished, though not very high; there are on its top two separate groups of cow-trees. When near it, the green verdant color of its top seems spotted on the Northern side with large white stains, which, in fine weather, may be seen 54 miles. Two miles East of Morro San Paulo there are 17 fathoms, 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 difficult.

A vessel may steer direct from Morro San Paulo to Cape St. Antonio; but if the wind blows 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, 8 leagues distant. It stands at the entrance of the bay of Rio Janeiro, and is distinguished by its round shape, and the green and white color of its shores. From the same point is seen the mountain called Gabia, or Main-top, which by its peculiar shape cannot be confounded with any other. When near Round Island, there is no difficulty in reaching Rio Janeiro. It is necessary 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 the land near Cape Frio, when bound for Rio Janeiro; this may do for vessels coming from the North or East, but in every other instance it will be wasting time.

When coming from the E.S.E. up to the S.W., the tops of the mountains resemble a man lying on his back, in a direction W.S.W. and E.N.E., the Main-top seeming to form the head, and 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, not so high, so distinct, or so near the shore, as the Main-top Mount. Its shape is very conical, and it appears above all the other mountains of a like shape around it, and seems to incline a little towards the N.W.

It is very prudent to keep at some distance from the shore, between Rio Janeiro and Cape Frio, because the sea-breeze blows towards the shore, and the waves generate a current, having the same tendency, particularly when it blows from S.W., and in case of a sudden storm there will be some danger in the anchorage.

It is prudent not 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 the day-time; for if engaged amongst them you may be dangerously situated, in case of a squall of wind: if not enabled to reach the harbor in daylight, it is better to put to sea again.

Rio Janeiro. Light. RIO JANEIRO.—To enter the harbor of Rio Janeiro, pass between the Island Rasa, (Bare Island,) on which there is a revolving light 150 feet high, and showing a bright and red light alternately, and the Islands 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. Steer 7½ miles N. 5° E., until 800 yards West of the fortress of Santa Cruz, on which is a fixed *Light.* light, at the Eastern extremity of the entrance. On that course you will pass on your port 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 the small island Toucinho, (Ham Island,) which is not far distant from the Sugar-loaf Mount. There is no danger. You have only to keep at a proper distance from the rocks which are visible. 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 passage between Fort Santa Cruz and Fort Lage is the only one used in passing—the one formed by San Joao Point is never used; not on account of deficiency of water, but because it is narrower, more crooked, the bottom rocky.

When 600 yards West from Fort Santa Cruz, the course to the best anchorage is N. 35° W., until you arrive E.N.E. of Fort Villegagnon, which you may pass at 600 yards distance. Then steer towards the Island dos Ratos, (Rat Island,) and, 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 the 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 lasts one half of the day. The land breeze begins in the evening, continues during the night, and stops at 9 or 10 in the morning; a calm of one hour generally succeeds it, and at about 11 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 three or four hours during daylight, 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 anchor.

Description of the Coast between the Island of St. Catharina and the Bay of Rio Janeiro.

Volage Bank. 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. From thence, while the ship

as sailing 2 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.

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, when coming from the Southward. *From Rio Janeiro to the River Plate.*

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 of the bay of Ilha Grande. The Eastern point of Maranbaya Island, is separated from the land of Guaratiba by a small channel, which boats only can enter. This island extends 8 leagues E. and W. It is very low, and must be approached with great caution, especially when the weather is not clear. This circumspection is 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 of water, with a bottom of sand and gravel.

BAY OF ILHA GRANDE.—The great bay of Ilha Grande 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. The bay 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." *Bay of Ilha Grande*

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 supplies both wood and water. The largest vessels may find anchorage on its Northern side, and supplies procured at the little village of d'Angra dos Reos, which is there situated.

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, is 8 miles wide, and may be 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. 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 3 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 Sachella, all situated on the Eastern side of the Isla 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, and 7 fathoms.

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 bring S. by E. ½ E., and 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 about mid-channel. After passing Starling Point, you will see a low and barren island, lying about 1½ miles from Ilha Grande, having 9 and 10 fathoms close to it. You then discover Terville Island, and also the town of Villa Grande; steer for the Island Terville, and you will have nowhere less than 6½ and 7 fathoms. Green Island lies so very close to Villa Grande, that, until you get close to it, it cannot be distinguished as an island.

You leave this on the starboard side, and Terville Island on the port, having 9 and 8 fathoms between them; keep close to Ilha Grande, until Gabia Grande is distinctly perceived; then steer towards it, and you will gradually deepen your water to 12 and 13 fathoms. Round close to the Island Gabia Grande, in 9, 10, and 11 fathoms, and then steer for the cluster of islands which lie round Jageson's, or Jagenos Island, and come to in 14 fathoms, sandy ground; the extremes of the islands bearing S.E. and N.E. by E., distant 1½ mile from the shore. There is a passage 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 port 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.

In sailing from hence, we kept the main-land on board, and when we were between the islands of Gabia Grande and Fortada, 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. Run into no less than 10 fathoms to avoid the reefs on that side; you will have 15, 17, 10, and in two casts only 5 fathoms, and before you can get the ship round, you will be in 4 fathoms: with the above soundings, Gabia Grande bears 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 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 lies in latitude 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 kinds 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 inshore 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 one 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 North-eastward in a semicircular form.

Mr. I. 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 one 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."

St. Sebastian's Island. SAINT SEBASTIAN'S ISLAND.—Point Pirasonungo, which is the Southeastern point of the island of St. Sebastian, bears from Redondo Island W.S.W. ¼ S., distant 40½ leagues, and from the Point Cariocu, S.W. ¼ S., distant 49 miles. This point, according to Baron Rouisson, is in lat. 23° 57′ 32″, and longitude 45° 20′ 18″ W., but Lt. Heywood, in 1810, made it only in longitude 45° 9′ 30″. 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. as 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.

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 being contracted by a reef, which stretches 2 miles to the S.S.W. of the former, it is hazardous for large vessels.

Strait of St. Sebastian.

THE STRAIT OF ST. SEBASTIAN, between the island and the continent, 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 Northwest side of the island, should first proceed South 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 mud. The greatest breadth between the island and the main is about 3 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 3 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.

You will find at St. Sebastian the advantages of a good supply of cattle, poultry, 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. Fish are seldom very plentiful, but they are of a good quality.

There are a great many watering-places on the island of St. Sebastian; one of the best is 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 of 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 $1\frac{3}{10}$ of a mile.

High-water.

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 3° 25′ E. 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 anywhere 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. ½ W., 50 miles from the Southern entrance of the strait of St. Sebastian, is that of Santos. 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 entrancefo 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. 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. 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., longitude 45° 46′ 32″ W.; the variation is 5° E.

It will here be proper to mention a rock first seen by Manoel Madeiros, a Portuguese commander, who sounded round it at 100 fathoms' distance, and was unable to reach bottom. He described it as a round naked rock, sometimes above water, and often covered by the swell of the sea. The mariners of Brazil allow the existence of this danger, which is said to lie 35 leagues S. by E. from the S.E. point of St. Sebastian, and 72 leagues E. 29′ N. from the N.E. point of St. Catharine's Island; or in lat. 25° 41′ 20″ S., long. 44° 59′ W. of Greenwich.

Light-house. W. ½ N., distant 11 leagues from the Alcatrazes, is the island of Moela, upon which a light-house is erected, which shows a fixed light, 100 feet above the sea. The island is situated off the Eastern point of the harbor of Santos.

Santos. SANTOS.—The port of Santos was formerly much frequented by Portuguese vessels. 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. The harbor of Santos will admit large ships, which mny ride sheltered from all winds, except those from S.S.W. to S.E.

The point of Taypu, which forms the Western point of the entrance, is in lat. 24° 1′ 11″ S., 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.

In steering for Santos from the Southward, you may pass close to the Island Redonda, bearing N.E. ½ N., distant one 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, you will see a rock 12 or 15 feet high, and a little larger than a line-of-battle ship's launch. The following are their bearings and estimated distances: 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.

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 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; the starboard side is the shoalest; keep 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, 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 port 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 with 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 ll attended to, will be fully sufficient to carry you in, clear of every danger. When u get abreast of the town, you will observe the high land opposite, on the Northern le of the river. You may pull towards this, and round Carvallo Point, pretty close which you will open the Lago de St. Rita. This lake is about 4 miles in circumrence. Steer right up it for the distance of a quarter of a mile, and stretch directly er for a low round island, thickly covered with brushwood: and when you get near this, you will perceive another island, somewhat similar in appearance. Keep arer to the first island, and pass between them; when you will open the entrance the river, and also will observe another branch or opening on the starboard side. eep the port shore on board, and pull up about 3 or 4 miles. You will then find the ater freshen. A boat may with ease make two trips a day; but as the atmosphere hot and sultry, all boats should endeavor to get on board before half after 3 o'clock; r at this time it commonly begins to rain, and continues to do so until 10 at night. ood is in abundance.

Le Laage, or Rock of Santos, lies 16½ miles S. 14° E. from the island of Moela: it is smooth white stone, elevated about 6 or 8 feet above the surface of the sea; it lies latitude 24° 18′ S., and in longitude 46° 17′ W. Midway between this danger and e port of Santos, there are 19 and 20 fathoms, with a bottom of sand and mud, which the usual quality of the ground hereabout.

Leaving the port of Santos, the coast runs S.W. towards the village of Conceicao, distance of 8 leagues. The land is generally low at the water's edge, but high in e interior; for a chain of mountains runs along 4 or 5 leagues inland, and the shore intersected and broken by several rivulets, which, in sailing along at a distance, ve to it the appearance of islands. This chain of mountains is broken by the harr of Santos, but continues to run E. by N. as far as the harbor of Sebastian.

The village of Conceicao is situated on a little mountain near the shore, 4 miles off, here you may anchor in 10 or 12 fathoms water. To the S.W. of Point Taypu, dint 20 miles, is an isolated rock, elevated about 10 or 12 feet above the surface of the a, which the Portuguese call Laage de Conceicao, at a pistol-shot from which are om 12 to 14 fathoms, sand and mud. Off this part you may distinctly perceive the rt of Santos. This rock lies 7 miles E. 31° S. from the village of Conceicao, and miles N. 4° W. from Queimada Grande.

The islands of Queimada are two masses of rocks, nearly barren, and distant from ch other 10 miles, in a S.E. and N.W. direction: the largest, which is furthest to e S.E., and may be seen 7 or 8 leagues off, has a little rock lying to the Northward it; you may, without danger, go between the two Queimades, or pass between them d the land.

In sailing along the shore to the South-westward, you will recognize successively e river and hill of Piruibe, the two isles of Queimada, the isles of Guarahu, the arra de Unha, the Point da Jurca, and the River Iguape. At the distance of from 3 10 miles off the land, you will have a depth of from 8 to 15 fathoms. The coast ar the shore becomes rather high, and runs S. 50° W., and the soundings opposite crease in proportion to the elevation of the adjacent coast.

IGUAPE AND CANANEA.—The coast from the entrance of the River Iguape to e River Cananea, is called the Playa de Iguape; it is a low sandy flat, except about e middle, and cannot be seen unless you are a very little distance off; therefore, in iling along it, you ought never to come nearer the land than 2 leagues; nor into less an 10 or 12 fathoms water, with a bottom of sand. It is separated from the continent by a lake, or natural canal, which communicates with the bar of Cananea, and is lled 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 nfound this opening with the bar of the River Iguape, which is situated 3 leagues rther to the North-eastward, in lat. 24° 35′ S. *Iguape and Cananea.*

You may anchor all along this coast at the distance of 2 or 3 miles off the Playa, excellent muddy ground, with from 6 to 10 fathoms water: but there are no ports this coast accessible to large ships, and there can be no necessity to anchor here, less 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 the island of Bom Abrigo, which lies to the Southward of the bar of Cananea, ithin which the Brazilians construct their large vessels; and the natives say that to ter the river "you may pass with a pilot to the Southward of the island of Bom brigo; but the common channel is to the Northward, although it is encumbered with any shoals." The Island Bom Abrigo is very high, and covered with trees: vessels ay anchor at a little distance off to the Eastward. There is a small island lying to e Southward of it, about 2 miles to the Eastward from which there are 11 and 12 thoms of 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 Ambrigo; the other is the Playa de Iguape, or flat, consisting of little down 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 therefor 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° 17′ 26″ W. The variation, 6 leagues off the land, is 7° E.

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 of 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 burden 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 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, nearly 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 do Superagui, it is fit only for boats. The course to Paranagua town and the Villa Antonina is due West. The former is on the port 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."

In following the land to the South-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. 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 one mile, from 15 to 10 fathoms, fine sandy ground.

Paranagua. 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 North-eastern 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 gray 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 lat. 25° 32′ 43″ S., and in long. 48° 25′ 40″ W. The variation is 6° 1′ E.

Guaratuba. GUARATUBA.—S.S.W. from the Barra do Sul de Paranagua 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 shoal runs up the Barra do Sul; this shoal extends 4 or 6 miles from the shore, and is bounded to the Eastward by the little islets of coral, and by two great

cks, 20 feet high, called the Itacolomis. The shoal is not navigable except by boats; t you may approach the rocks Eastward to the distance of one or two miles, where u will have from 10 to 12 fathoms water, sand and mud.

This river is remarkably rapid, and famed for its fisheries. Whoever runs for the rbor from the Northward, should keep close to the land, make for the point of the ck above mentioned, and, when about to enter, keep the small flat island astern: is island lies about 1½ mile to sea, and your anchorage will be immediately behind e hill to the Northward, or opposite to the hill on the South side. This river is pplied by several others, of which Rio St. Joao is the most considerable, and is id to be navigable for upwards of 12 leagues.

Rio San Francisco.

RIO SAN FRANCISCO.—About 16 miles South from Guaratuba is the North- n entrance to the Rio San Francisco, capable of accommodating any vessel, and ving from 6 to 13 fathoms in its channel. To sail in, it is advisable to coast up the d which lies to the Southward, in 6, 7, and 8 fathoms; and when you arrive at e headland where this coast ends, you should make for the Northern point, taking re to avoid a bank running to the N.E., which is shoal, having not more than one thom at low-water; and as soon as this North point comes abreast, stand S. by W. r the town, or for the church of St. Joze, built on an eminence, opposite to which u may anchor in clear ground. This entrance may be known by the high woody nd of San Francisco, which terminates at the hill; and also by the three islets ly- g 2 or 3 miles to the Westward of this hill. The other entrance to the river, called e Aracary, is 6 leagues to the Southward, and fit only for canoes; but opposite are me islands with anchorage and shelter from the sea, in 4 and 5 fathoms water, on a ttom of whitish sand.

The islands of Garcia lie on the parallel of the point of Joao Diaz, which forms e Eastern extremity of the bay of San Francisco, and are situated about 2½ miles m the point. Fourteen miles to the Southward of this group are the Tamboretes ands, from abreast of which the coast turns more to the Westward, so far as the ver Aracary; near the bar, or entrance of which, is another group, called the Reme- s: all these islands lie at the distance of 2, 3, or 4 miles from the coast, and are d to have passages between them. The islands are covered with trees; but be- een the Remedios and the mouth of the River Aracary, the passage is said to admit small vessels only, and is not to be depended on.

The River Aracary, after running a considerable way up, and separating the island San Francisco from the main, turns N.E. Easterly, and runs into the sea at a spa- us bay of the same name, where you may anchor in several places. At 2 leagues m the shore, N.N.E. from the entrance of Rio San Francisco, you will not find more n 6 fathoms water, on a bottom of fine sand. The coast is flat, the land adjacent little elevated, but interspersed with desolate spots, which are rather remark- e. A few leagues in the interior are the Sierras of Maratuba, a chain of very high untains.

Directly South of the Remedios Islands, distant 6 leagues, is Point Itapacoroya, Eastern extremity of a bay, rather deep and sheltered by the winds from the uth and West; here are an armacao, or oil-house, and two little rocky islands, near ich you may anchor in sufficient depth of water. At the bottom of this bay the d runs N. ¼ E., so far as the Islands Garcia, where you may see another armacao, whole distance being 13 leagues.

S.S.E., 7½ leagues from Point Itapacoroya is the point of Bombas, and between m are the points of Cambecudo, Camboriu, Ytapeba, and Garopas, forming seve- bays. You may safely sail along these points at the distance of 2 or 3 miles. The rance to Garopas Bay is 8 or 9 miles broad, and well sheltered from all winds, h depth of water enough for any ship. Two rivers discharge themselves into it r beds of white rocks, and the surrounding land is covered with thick woods. To Southward is Point Manduri, from whence you proceed on Southerly to the island St. Catharine.

Island of St. Catharine.

HE ISLAND OF ST. CATHARINE is situated at a little distance from the tinent, upon the parallel of 28° S.; it is visible 15 leagues off, in fine weather. the above distance you will find 70 fathoms; thence the depth diminishes gradu- to within 4 cables' length of the coast, where there are 4 fathoms.

n approaching from the Eastward, this island appears very uneven, being inter- ted with mountains and deep valleys: its elevation is greater at the Southward n at the Northward. Across it the mountains on the continent are a little more vated than those on the island; and you will distinguish among these principally Morro de Camborella, which is a branch of the Eastern Cordilleras, which extend n Rio Janeiro to this island.

bout the middle of the island, and near the edge of the sea, is a large lake which ents an opening that may serve to distinguish it as a landfall. At 3 leagues from Eastern coast, if you bring this opening to bear West, the N.E. point of the isl-

and 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.

North Channel.

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. All the points which surround this passage you may sail close to, and beat up to them without the least risk or danger. There are 26 feet water at 600 fathoms distance from the N.W. coast of St. Catharine's, which is the deepest water in this part of the channel.

Anchorage for large vessels.

When you are within the bay, you may anchor anywhere, 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 fathoms 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's. 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 highlands with which it is surrounded, the only exposed part being to the N. Eastward; but the winds from this part are 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 supplies, &c., which the country produces. The provisions consist of bullocks, pigs, fowls, maize, rice, spirits, farina, dried meats, sugar, coffee, all tropical fruits, &c. The island of St. Catharine's is, therefore, one of the best ports at which a vessel can be supplied with necessaries.

The anchorages of this island are sometimes plentifully supplied with fish. Most of the shores are covered with the bones of whales, which it is 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's follow the direction of the channel, whether inwards or outwards, but these are seldom violent; and the storms are not dangerous to vessels 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, the greatest quantity of rain falls during the months of August and September.

Tides.

The tides are regular at the anchorage; and it may be remarked, that as they flow into the North and South entrances of the strait at the same time, meeting at the

anchorage near the town, they turn in a similar manner, with more or less velocity, according as they are accelerated or retarded by the prevailing winds.

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 1½ mile per hour, and then the water rises 6 feet. It is high-water at the above anchorage at 40 minutes after 2, full and change. *High-water.*

The position of the flagstaff 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 is 7° 29′ 26″ E.

The island of St. Catharine's 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 Zombo 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 gray sand: you have only to avoid the rocks and breakers of San Pedro, situated rather less than 3000 fathoms (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.

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 bailing with buckets; but this supply in dry weather sometimes fails. Wood may be either cut or purchased.

The island of Santa Catharina 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 Catharina 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, arrack, &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 Catharina is everywhere very high. Woody mountains and deep valleys are to be discovered all round. From Santa Catharina 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 anywhere. 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 very high mountains 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 exist 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, or oil-house, 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. Go no nearer the shore of Sebastian Island 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 Catharina for provision of any kind.

St. Catharine to Cape St. Martha Grande.

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 from 70 to 80 fathoms, 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, and may be coasted at 3 or 4 miles off, passing 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 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 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 Raton Islands on your port hand, not less than 1½ mile 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 with Cape Quebra Cabaco. You will then have on your starboard hand a flat rock, on which, at low-water, there are about 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 port, and come to an anchor in 19 to 20 feet water, the island of Gato bearing, by compass, N.N.E., the islet of Vinhas, S.S.E., and the steeple on 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. long.; the variation is 5° 29′ E.

In coming from the North bar to the city, we frequently found but 7 feet 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 Molequez, 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 Uvidoa, Point Viraquera, Point Bituba, or Embituba, Morro-da-Barra, Morro-da-Forro, Cape Santa-Marta-Pequeno, and Cape Santa-Marta-Grande.

At Point Bituba commences the beach, behind which is a lake and the cities of Villa Nova, Santa Anna, and 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 Santa Marta Grande.

CAPE SANTA 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 longitnde 48° 49′ 49″ W.; the variation is 7° 20′ E.

From Cape Santa Marta Grande to Rio Grande de San Pedro.

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 furthest. It may be divided into three parts. The first runs N.E. and S.W. true, and is called the Beach of 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.

BEACH OF TORRES.—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.

We found 30 fathoms of water, bottom of sand, mud, and shells, 4 miles South of Cape Santa 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.

BEACH OF FERNAMBUCO.—This is more perpendicular than the first, especially in the latitude of 30 and 31 degrees. There are 40 fathoms water, with a bottom of sand, mud, and shells, 4 to 5 miles from the shore.

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.

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. 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 are 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 light.

RIO GRANDE LIGHT is an iron structure, 114 feet above the level of the sea. It is a revolving light, making its revolutions in 3 minutes, presenting three views of bright light, three darker, and three eclipses. It can be seen from 25 to 30 miles. Lat. 32° 7′ 15″ S., long. 52° 4′ 25″ W.

Rio Grande de San Pedro.

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 light-house, which is situated at the North point of the bar, 2 miles inside. You must not, if possible to avoid it, get embayed or windbound on the South side, because the sea breaks in the shoal water.

When you make the tower, endeavor to get it to bear North 5 or 6 miles, then steer direct for it, but be particular to observe if a red flag be hoisted on the tower. If so, it signifies you must approach and continue to advance (as long as the flag is up) direct for the tower, until you see a boat, which will be at anchor on the bar, in which a pilot will be situated, showing flags which represent the depth of water on the bar as follows:

A blue flag over a red flag, 10 feet.
A red flag over a blue flag, 10 feet 6 inches.
A blue pendant over a white flag, 10 feet 10½ inches.
A white flag over a blue pendant, 11 feet 3 inches.
A blue pendant over a blue flag, 11 feet 7½ inches.
A blue flag over a blue pendant, 12 feet.
A blue pendant over a red flag, 12 feet 4½ inches.
A red flag over a blue pendant, 12 feet 9 inches.

Steer for the boat, guiding yourself by a staff with a flag, which is inclined by the man in the boat as follows: If the staff is held upright, it denotes you are steering correctly; if the staff be inclined to port, or starboard, you must luff or keep off accordingly; if the flag on the tower is hauled down, you must not approach. From the tower they also throw out lateral flags, particularly in rough weather, to guide vessels keeping off or luffing, according as the flags are shown to North and South.

There is good anchorage 6 miles from the tower, which bears North, 6 miles distant; but as a general rule it is best to avoid anchoring. At night keep in 10 fathoms water, or over, and be very careful to sound frequently when your head is to shore. The soundings diminish regularly to 5 fathoms, which is close to the breakers. On the beach to the South of the bar the water decreases gradually, but to the Northward it shelves more suddenly.

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° 08′ 45″ W. longitude. The variation is 8° 30′ E.

E. by N., 12 miles from the light, there is a rock of 8½ and 9 fathoms, with 14 fathoms inside of it.

FROM RIO GRANDE DE SAN PEDRO TO CAPE ST. 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. *Cape St. Mary.*

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 N.E.

South of the Castillos is Bahia Falsa, of which we shall speak hereafter.

Some time before arriving at the these rocks, if you coast along the land 11 to 12 miles in coming from the North, 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 port; you will then perceive two hills having the form of teats, the only ones which can be seen to Cape St. Mary.

WINDS, TIDES, AND CURRENTS.—At the island of St. Catharine's, 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. *Winds, Tides, and Currents.*

The tides are not regular in the strait, until the approach of new and full moon. The difference between high and low water is, there, scarce above 5 feet.

The sea rises in the South basin from the South to the North, and it rises in the North basin from the North to the South, 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 usually 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. 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 Pilcomaya, and Rio Grande de Curtiba. *Rio de la Plata.*

The capes which mark the entrance are those of St. Maria and St. Anthony; 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. Anthony and the mouth of the Parana, is, on the contrary, very low; it is on this side that 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 into two parts, nearly equal in length.

The first extends from Cape St. Maria and St. Anthony on the North, to the river of Santa Lucia, and South to Point das Piedras de San Borrombon; the water of the river is brackish. The second part extends from these points to the confluence of the Uruguay and the Parana; the water is here generally sweet.

The depth of 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 sandstone, 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. Anthony, 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 Borrombon has a border of soft sandstone 2 to 3 leagues wide, on which it is very shallow.

The Point das Piedras de San Borrombon forms with Cape St. Anthony a great bay, called the Ensenada de San Borrombon, in which two small rivers discharge themselves, the San Borrombon and the Salado: this last is the largest. 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 North part of the entrance are two banks of sandy land, on which two batteries are built.

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, or 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 26 leagues; from Maldonado to Monte Video, 21 leagues; and from this last city to Colonia, 28 leagues; the distance from Cape St. Maria to the Uruguay is thus 75 leagues.

From Cape St. Anthony to Buenos Ayres is 45 leagues, and from thence to Parana 5 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; Goritti, in the bay of Maldonado Flores, E. of Monte Video, 15 miles; San Gabriel, Farallon, and Lopez, before Colonia; and Hornos, 5 and 6 miles West of the city. The rocks are all a short distance from the shore.

The islands situated at the point of Santiago of Ensenada, being very small, we do not mention.

Banks. 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. 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 mouth 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 soundings 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 Ciudad, 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 Banks; 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 containing a revolving light on the isle of Flores, elevated 99 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. It is badly attended, and frequently not lighted.

Light.

Winds, tides, and currents. 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 the summer, and in fine weather, the winds blow in the whole river, with considerable regularity, from the E. to the S.E. from 10 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 Pampas, 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 Brittany; it blows usually after rain, or when the wind has varied from the N. to 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; and it is then called in the country the Turbonada (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. *Tide.*

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.

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. *Anchorages.*

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 Borrombon 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 Borrombon, and at Riachuelo, near Buenos Ayres, on the South side.

You can come to anchor at Maldonado in 6 to 8 fathoms 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 Borrombon, 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 anchorage, 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 Hornos Islands offer an excellent anchorage, because the sea is broken off by the Palmas Bank.

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. *Depth of the River.*

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.

In sailing on parallels further 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 2 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.

Points to Recognize. POINTS TO RECOGNIZE IN MAKING THE LAND.—There are three, Cape St. Mary, Lobos Island, and Cape St. Antonio.

Cape St. Mary. CAPE ST. MARY.—Its position, determined on shore, is 34° 39′ 1″ S. latitude, and 54° 9′ 45″ W. longitude. The variation of the needle is 10° 7′ 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 the 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 inclosures.

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. It is named 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., 13 miles distant, 20 fathoms, sand; and S.W., from 18 to 22 fathoms, bottom of mud.

Isle of Lobos. ISLE OF LOBOS.—It is situated in 35° 1′ 00″ S. latitude, and 54° 52′ W. longitude, 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. The Eastern part ought to be avoided, as a chain of reefs extends 3 miles off. A light-house is proposed to be built here.

This island is without vegetation. In the strait between it and the main-land, there are 17 fathoms of water.

The variation of the needle is the same as at Cape St. Mary.

Cape St. Antonio. 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 36° 19′ 36″ S. latitude, 56° 47′ 15″ W. longitude. The variation of the needle is 13° 30′ 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.

Navigation of the river. NAVIGATION AT THE ENTRANCE AND IN THE RIVER PLATE.—The description that we have given of this river naturally indicates the precautions 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.

You cannot depend upon the soundings, as they are on all the coast nearly at the same depth and quality as towards the entrance of the river. Besides the Great Bank between the Rio Grande de San Pedro and the Castillos has the same sort of soundings we met with West of Cape St. Mary, and this resemblance causes 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., by making the land about Cape St. Mary, you can recognize a larger extent of land before entering the river. But in all other circumstances Lobos Island 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.

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 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, which is the West extremity of the bay of Maldonado. It is very near the same parallel the as tower of the city. *Course to Monte Video.*

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 27 miles distant from Flores. The soundings are then 12 to 13 fathoms, 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 port side, leaving the island on the starboard hand, and passing within 2 or 3 miles South of it: or 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, which extends 1½ mile North. You can anchor only North of the tower, one or two miles distant.

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 straight 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 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 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 port 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.

MONTE VIDEO LIGHT is a revolving light on the Cerro, 486 feet above the level of the sea. It has a flash of 30 seconds every 3 minutes, and can be seen 30 miles. Lat. 34° 53′ 15″ S., long. 56° 14′ 45″ W. *Monte Video light*

If you wish to go to Monte Video South of the English Bank, you must enter the river 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, further on muddy sand, and again mud. You will be in this last case on the meridian of Monte Video, and ought to see the hill of Monte Video, which can be seen in the day-time, in clear weather, 9 leagues distant. The position of this hill is 34° 53′ 2″ S. lat., 56° 16′ 30″ W. long.

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 port, 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 is 11° 42′ 24″ 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.

Course to Buenos Ayres.

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 position is 35° 27′ 40″ S. lat., 57° 9′ W. long. 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., and 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.

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 Monte Video 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 to 17 feet, should choose the passage between the Ortiz Bank and Chico Bank.

Passage between Chico Bank & the land.

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.

Light-ship.

There is a light-ship, with a red flag in the day-time, between Point Indio and Ortiz Bank. From it Indio Point bears S.W. ¼ S., 9 miles distant; and the S.E. point of Ortiz Bank N.E. ½ N., 7 miles distant. Pilots can be obtained on board.

Point Indio is in 35° 15′ 20′ South lat., 57° 11′ 42″ West long., 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, 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 sandstone, 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 sandstone 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 Ortis.

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. When these

different objects are well distinguished, 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 is 12° 30′ 59″ 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. *Passage between Ortiz and the North side.*

The Panella Rocks are situated in 34° 51′ 15″ S. lat., and 56° 26′ W. long. 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 lat. is 24° 25′ 20″ S., and the long. 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, which will bring you 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.

COLONIA BEACON is a fixed light on the S.W. angle of the Plaza, which can be seen 6 miles. *Colonia Beacon.*

When you are before the city of Colonia, and have on your right the San Gabriel Islands, Farallon and Leper, steer 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.

POINT JESUS MARIA.—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 12 feet. *Point Jesus Maria.*

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 Magdalena S.E., and avoid by this course the new bank. From this the course is N.W. ½ N. *Passage between the Chico Bank and the Ortiz Bank.*

This course leads directly to the edges of the Ortiz Bank: as soon as you come up to this bank, and have 3¼ to 3½ fathoms, steer 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 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.

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, covered with small trees, and very bushy. *Course for the Hornos Islands.*

You will anchor N.W. from the outer one, and at from one to one and one-third 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 is 11° 8′ E.

Additional Remarks.

A shoal is said to exist in latitude 36° 28′ S., long. 51° 30′ W., about a mile long, and the same in breadth, with a sea breaking very high over it: it has the appearance of sand, and a little water on it.

At the entrance of the Plata, the prevailing winds, during the summer months, from September to March, are North-easterly, with tolerably clear weather overhead, 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 Ortiz, 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, when the winds are strong at N.W., there is so little, sometimes, as 15 feet water; while with strong breezes from E.S.E to S.S.W., the depth is upwards of 5 fathoms; but except on such extraordinary occasions, there are between 17 and 22 feet water. It is said that the river has been almost dried up across from Buenos Ayres to Colonia, during heavy Westerly gales.

The River Plata has many singularities. 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 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. 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 the South-west, without stopping in the South-eastern quarter.

When the wind continues in the North-east quarter, the mercury is more depressed (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 outset 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 outset 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.

The velocity of the tide or current, in the River Plata, seldom exceeds 3 knots per hour; although some have found it to run at the rate of 6 or 7 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, it is on the whole, most advisable for ships bound in 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 36 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 latitude 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.

Latitude 34° 20′ S., and longitude 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 7 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 latitude 35° S., and longitude 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 until 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 longitude 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.

THE COAST FROM THE RIVER PLATA TO THE RIVER NEGRO.

PIEDRAS POINT should be approached with more caution than any other land near the entrance of the Plata, excepting the North-east part of Cape San Antonio. *Piedras Point.*

The point is low and ill defined. A few trees of stunted growth show themselves at a small distance from the shore; but as the land is almost flat, and not 20 feet above the level of the river, it is difficult for a stranger to recognize the spot, either by description or by a drawing.

Very near the point, about half a mile inshore, is a single tree; 2 miles South-west of the point is another tree, rather larger. Six miles to the South-west is a clump of trees; 4 miles beyond which is another clump; all easily distinguishable by those who are accustomed to low land, but appearing like bushes to eyes familiar with such noble scenery as that of the coast of Brazil.

Northward, and to the North-west of Piedras Point there are no distinct trees; although straggling bushes are sometimes altered in their appearance, by refraction, so much as to deceive a practised eye.

Towards the East and South, extends a dangerous bank, to the distance of 7 miles in an Easterly direction, and 15 towards the South. The North part is hard clay, with many patches of Tosca, (clay hardened to the consistence of half-baked bricks,) almost as injurious to a vessel as actual rock. *Piedras Bank.*

Within the limits of the bank, the bottom is uneven, and the lead cannot be trusted. Outside of the limits a vessel may go by the lead, with confidence, accord-

ing to her draught of water. But in estimating distance from this low land by the eye, one may be very much deceived, so much is it at times either elevated or apparently depressed by refraction. In approaching the banks from the Northward or Eastward, the ground hardens, and the water decreases gradually in depth; from the Southward the decrease of depth is somewhat quicker, though the bottom is not nearly so hard.

Salado River. From Piedras Point to the River Salado, the land is uniformly low and level. Besides the clumps already mentioned, there are but a few straggling trees. Having given a wide berth to the South-east part of the Piedras bank, and being to the Southward of it, a vessel may close the land, from 5 to 8 miles, according to her size, off the mouth of the Salado.

Northward the land is, as has been said, uniformly low, not exceeding 20 feet above the level of the water, in many places much lower; but to the Southward of the river, distant 5 miles from its mouth, is a rising ground covered with trees, called *Mount Rosas.* Mount Rosas. The highest part of this mount may be 30 feet above the water. Being covered with trees, and higher than the adjoining land, it affords a good mark for the entrance of the Salado. Another remarkable object is a red brick-kiln, 20 feet *Brick-kiln.* in height, upon the shore, 2½ miles S.S.W. of the mouth of the river. When within 4 miles distance from the shore, the entrance of the river is distinguishable. Two wrecks now lie near, but they will of course soon perish. The Salado is a very shallow bar-river, unfit for anything but the smallest vessels. At times, when the Plata is high, there are 6, 8, or 10 feet water on the bar. But at other times the smallest boat cannot even approach the mouth of the river; and the mud is so soft that one cannot walk from the boat, lying aground, to the firm land. There are a few houses near the Salado, and on Mount Rosas.

Sanborombon River. The San Borrombon River is frequently dry, and is not navigable.

From Mount Rosas to Cape St. Antonio the land is very low, and quite flat. Trees occasionally show themselves The great extent of the Tuyu bank prevents even the *Tuyu Bank.* smallest vessel from approachtng this half-drowned land. The ground near, and even on the bank, is extremely soft; the depth decreases gradually, and with the lead going there is no danger. This bank is also called Arenas Gordas.

In San Borrombon Bay, particularly within 5 miles from the land, the bottom is so soft that the lead sinks 1, 2, or 3 feet into the mud, if suffered to lie on the ground. In the bay there is but little current at any time.

Rasa Point. Rasa Point, the Northern extremity of Cape San Antonio, is a low sandy spit, extending to the Northward, and under water towards some breakers, near the Northern limit of the Tuyu bank.

Close behind Rasa Point, to the West, is the little river Tuyu, communicating with several lakes, with 2 fathoms water at its entrance. There is a small creek winding through the Tuyu bank, by which a very small vessel can approach and enter that river. The creek is extremely difficult to find, and at present of no consequence.

At Rasa Point the almost united land and water of the coast of Sanborombon Bay is succeeded by a well-defined, though low, extent of sand and shingle. The Tuyu bank gradually diminishes, and a few miles South of Rasa Point vessels may approach the land as near as 2 or 3 miles.

From Cape St. Antonio, Southward, the coast is of a light color, low and sandy. Occasionally straggling bushes, or patches of rough grass, are seen. Sand-hills between 20 and 40 feet in height begin to show themselves 10 miles to the Southward of Rasa Point, gradually increasing in number and height as they approach Medano Point, rising near that point to 100 feet above the sea. Two of these sand-hills, near one another in latitude 36° 27′, remind one of a Spanish saddle; they are rather higher than their neighbors.

Currents. Off Cape St. Antonio there are currents setting into or out of the Plata, varying in their strength and duration as the winds vary, by which they are principally governed. Generally speaking, the current sets to the Northward before and during the commencement of Southerly winds, from 1 to 3 knots; and to the Southward before and during the beginning of Northerly winds, with about the same strength.

Off Medano Point is the Medano Bank, an extensive and dangerous shoal stretch- *Medano Bank.* ing 6 miles to seaward. Generally the water upon it is much discolored, and the lead will give warning; but at any time, even in fine weather, it is more prudent to give this shoal a wide berth. In crossing it, irregular and shoal soundings are obtained; and at 3 or 4 miles from the shore there are places over which are not more than 2 fathoms water.

About Medano Point the land is higher than to the Northward or to the Southward. A range of hills between 100 and 200 feet in height, appears to stretch to the N. W., or more Westerly. The Medano shoal seems to be a continuation of that range; irregular soundings, with many shoal spots, may therefore be expected.

From Medano Point to the narrow isthmus between the sea and the lagoon, called Mar Chiquito, the coast is lower than near Medano Point; but it has a similar appearance, sand-hills, with a few patches of verdure, being the only objects visible. These sand-hills, and the coast near them, have a whiter look than those to the Northward of the point.

In approaching this part, there is no danger while at a reasonable distance from the shore—from 1 to 3 miles, according to the weather; but as in some places, especially to the Northward, near Medano Point, the soundings are irregular, shoaling suddenly, a fathom or two at a time, and then deepening again, it is as well not to go nearer than 3 miles.

Mar Chiquito.

Mar Chiquito is a lagoon of salt water (visible from the mast-head of a passing ship) into which flow the Tandil, and other small rivers. At times it overflows and runs into the sea, but generally there is a dry bank of shingle between the two. From the spot where the Mar Chiquito overflows, the land rises and is no longer sandy. A low range of cliffs, from 20 to 30 feet in height, is surmounted by a rising ground, of which the highest part is about 80 feet above the sea. Pasture land now meets the eye. On that high ground near which is the Estancia de la Loberia Chica, (Seal Farm,) thousands of fine cattle may sometimes be seen feeding.

Cape Corrientes.

Cape Corrientes is a high and rather a bold headland; the South-eastern extremity of a range of hills running nearly East and West. The Sierra Tandil and Sierra Vulcan form part of this range. In clear weather three ranges of the latter are visible from a vessel at sea, and have a singular wedge-like form, somewhat resembling the Bill of Portland. These ranges of high land are like the downs on the English coast, but they do not end so abruptly, nor with such imposing cliffs. Near the sea they slope away gradually, and are ended by broken rocky shore.

Half a mile to the Northward of the cape is a little bay, where a boat may land in fine weather. The Southern side of the bay is bounded by the rising ground of the cape; the Northern by the cliffy shore under the Estancia. A vessel may anchor in this bay during off-shore winds, in from 5 to 10 fathoms water, over a clean sandy bottom; but with Easterly winds of any strength a heavy swell would set in, and render the anchorage unsafe.

There is a bare sandy place on the East side of Cape Corrientes, around the upper part of which the green turf has so regular an edge that it appears artificially cut; and all the higher part of the cape is covered by smooth green turf, without either trees or bushes. The highest part is 120 feet above the level of the sea.

Mogotes Point.

Five miles Southward is Mogotes Point; high, bare, and sandy; ending towards the sea in a low projecting spit, which requires a berth of 2 miles in rounding the point. The summit is 104 feet above the sea.

When near the point you can distinguish several sand-hills, some of which are peaked and higher than others. Behind the sand-hills the down-like hills, described above, extend to the Westward.

Off Mogotes Point it has been said that there is a shoal; but no less water than 7 fathoms near the shore, and 9 fathoms at 5 miles distance, was found by the Beagle when seeking expressly for the reported shoal, excepting on the ridge which continues under water one mile from the spit off the point.

Andres Head.

Andres Head is the South-west extremity of a range of high bold cliffs, which extend from the North-east half-way between that Head and Mogotes Point. From the place where they end the shore is low, sandy, and rocky.

The bay, or rather bight, between Mogotes Point and Andres Head should not be entered by ship or boat. Many sunken rocks lie near the shore, causing blind breakers at sudden intervals.

The highest part of the cliffs, near Andres Head, is 70 feet above the sea. A short distance inshore of those cliffs is the Estancia de la Sociedad (Society Farm), formerly the Estancia de la Loberia Grande (Great Seal Farm.)

Current.

Off the projecting land, which extends from Andres Head to Cape San Antonio, the current sets strongly to the Northward previous to and during Southerly winds; and as strongly in the opposite direction under contrary circumstances. From 1 to 3 knots are usually the limits of strength, although there are intervals when no current is perceptible.

Hermeneg Point.

From Andres Head to Hermeneg Point the coast is rugged, not high, nor yet very low, from 30 to 80 feet being the usual height. There are a few detached irregular cliffs, and some gaps, or creeks, which might afford a landing-place for a boat in fine weather; but there is neither shelter nor anchorage for a ship.

Close to Hermeneg Point is a little bight, into which runs a small stream of fresh water.

Very few bushes appear on this part of the coast, and scarcely a tree, excepting a few near the Estancia de la Sociedad. Sometimes a considerable extent of grass land

appears, but in most places near the sea the ground appears sandy and barren, thinly covered here and there by coarse grass, or by low prickly shrubs.

Black Point. From Hermeneg Point to Black Point, and thence onwards to Asuncion Point and Mount Hermoso, the coast has a similar appearance, and is equally unfit to approach. Occasionally the sand-hills rise higher, to 100 or 130 feet above the sea, and some are more than usually barren, or there are a few more bushes, and rather more grass, to vary the view; but there is no other variety.

Gueguen River. About 5 miles to the Eastward of Black Point the River Gueguen, or Josef, runs into the sea. Its entrance is accessible to boats during moderate weather, when there is not much swell; but it is inaccessible to small vessels. A large swell is generally rolling towards this shore, so fully exposed to the Southern Ocean.

If a vessel should anchor near any part of this coast, it is probable that she will lose or break her anchor in endeavoring to weigh. Hard tosca, full of holes, receives the anchor in most places. On the lead fine brown sand and broken shells always come up, indicating a clean bottom; but the sand lies thinly over the treacherous tosca.

There is sufficient depth of water for the largest ships near all the coast between Cape San Antonio and Asuncion Point, excepting near the Medano bank and Mogotes spit.

As you approach the land the soundings decrease gradually. They extend to a great distance. When 50 miles off shore you will find between 30 and 60 fathoms. At 100 miles distance there are between 50 and 80 fathoms. The bank of soundings may be traced to an average distance of 150 miles from the land.

Ariel Rocks. Some rocks, or a shoal, said to have been discovered by the Ariel, of Whitehaven, Dixon master, have been sought for repeatedly, without the least success. Their alleged situation is in the track of vessels trading between the Rivers Plata and Negro.

El Rincon. The deep bight, formed by the sudden change in the direction of the coast on each side of Bahia Blanca, or Blanca Bay, is called the Rincon (corner.) Generally speaking it is shallow.

Inside of an imaginary line drawn across this deep bight from the River Gueguen to the River Colorado, more than 20 fathoms water will not be found. Between that and 10 fathoms will be the depth until you approach either shore near enough to see the highest parts in clear weather, with the eye 20 feet above the water; and throughout the space thus described there is anchorage during North or West winds. South or East winds send a swell into the Rincon which obliges vessels to keep under sail. But it should be remembered that winds prevail from North and West during at least four days out of five.

In the Rincon, and along the coasts to the Eastward and Southward, the lead will invariably bring up sand, or sand mixed with broken shells, and perhaps some gravel, but the quality and color of the sand is very different in different situations, and should be carefully noticed, whether with a view to anchoring in good ground, or avoiding any of the numerous and very dangerous sand-banks which throng the coasts between Bahia Blanca and the River Negro. On and near the banks the sand is always of a dark brown color, very fine, and generally unmixed with other substances; sometimes bits of shell come up on the lead; seldom anything else. If an anchor is let go upon this sort of ground, its recovery is doubtful. There may be soft ground underneath, but rarely; most of the banks are formed of tosca, and this very fine dark brown sand is simply the tosca pulverized. In the offing, over soft ground, the sand is speckled, or black or white, rather fine generally; when coarse it is mixed with gravel: broken shells are frequent, though not so regular in their location as to assist in ascertaining a ship's place.

Having such soundings as those last described, the seaman may be certain that his ship is out of danger from a shoal; and that if necessary an anchor may be dropped with confidence. At night, if the weather is moderately fine and the wind off shore, it is better to anchor than to keep under sail.

Tides. The tides set strongly, the flood to the North, the ebb in a contrary direction, nearly six hours each way. They are much influenced by the winds, their strength varying from 1 to 4 knots when within 10 miles of the banks or land; and from half a knot to 2 knots when between 10 and 20 miles from the outer limit of the dangers.

If the weather threatens, or the wind is Southerly or Easterly, it is more prudent to stand directly off shore during the greater part of the night. Heaving-to, or making free with the land, is not to be recommended on any coast, much less on this, which is considered by those who have frequented it during many years to be most intricate and dangerous.

The land is extremely low, almost flat, in most places. The banks are very extensive, and suddenly steep. A vessel may shoal her water from 10 to 2 fathoms in 2 cables' length, even while out of sight of land from the deck. To these inconve-

niences should also be added strong tides, and gales from the South-east, which bring thick weather and a heavy sea, overfalling and breaking as it approaches the banks.

When entering the Rincon, if the object be to anchor in or near Bahia Blanca, the Northern shore between Black Point and Asuncion Point should be kept in sight from the main-top; or the ship should be kept between the parallels of 39° 5′ and 39° 15′.

Eastward of Asuncion Point, the land may be approached as near as may be thought proper, but from that point to the Westward more caution must be used, particularly when about 10 miles West of Asuncion Point, as well as in the immediate vicinity of Bahia Blanca.

To the Westward of Asuncion Point, and thence along shore, the soundings are irregular, within 8 miles of the land. Ridges of tosca run out in a South-east direction, from 5 to 10 miles from the shore. These ridges are so frequent, and so regular, that crossing them from North-east to South-west gives one the idea of a vast land-swell, the hollows of which are 6 fathoms lower than the risings, and about 2 cables' length from one hollow to another. In crossing those spaces the lead shows from 10 to 4 fathoms; and the water deepens again as quickly as it shoals. From 8 to 6 fathoms is the usual change; 10 to 4 is the extreme.

At a less distance than 5 miles from the land, near Asuncion Point, these ridges have not 4 fathoms water over them; and by keeping within the limits above mentioned they will be avoided.

When to the Westward of the meridian of Asuncion Point, and between the parallels of 39° 10′ and 39° 20′, the Sierra Ventana will be seen if the weather is clear.

Sierra Ventana.

The Sierra Ventana is a high mountain 3,500 feet above the sea, a considerable height anywhere, but in this low country extraordinary. When seen from the South-east the summit is peaked; seen from the South it appears rather square, with a notch in the middle.

A good bearing of this mountain (astronomical if possible) and the latitude of the ship will fix her position with certainty.

Supposing that the weather is thick, or that the Sierra Ventana is not seen, the distance of the vessel from the North shore should first be ascertained, either by latitude or by steering due North, with attention to the lead and the lookout, until the water shoals to 8 or 7 fathoms, if the land is not seen previously to obtaining that depth. Reference to the chart and the ship's reckoning will show the position. By distance from the land, which runs nearly East and West from 10 miles West of Asuncion Point, the latitude will be known.

Asuncion Point.

Being about 10 miles West of Asuncion Point, (which is a projecting sand-hill 120 feet above the sea, difficult to distinguish with certainty, yet the most marked feature of this unvaried coast,) and 8 or 9 miles from the North shores, in latitude 39° 10′, steer so as to make good a true W.S.W. ¾ W. course, and a distance (by ground log) of 30 miles. The vessel should be kept as nearly as possible in the parallel of 39° 10′, not going to the Northward of it, when between 40 and 10 miles East of the meridian of Mount Hermoso, nor to the Southward of it when less than 10 miles from that meridian.

Excepting the Sierra Ventana and the Northern shore, no land will be seen. The Northern shore will appear low, just topping above the horizon of an eye 20 feet above the water.

Monte Hermoso.

Monte Hermoso is a little round hill, higher than those around it (excepting one little hillock, which is rather more inland). It is close to the sea, and forms, when seen from the Eastward, a distinct finish to the sea-coast; Westward of it the land is lower, and is not at first visible. Upon it there is a pile of tosca, 10 feet square, raised by the Beagle's crew. Below the mount a low cliff of about 12 feet in height will be seen; it is the only one hereabouts, and is called Papagayo cliff.

North Bank.

Between Monte Hermoso and Bahia Blanca the North Bank, which shoals very gradually, projects S.S.E. from the shore; and which, with the two Toro Banks, nearly block up the entrance into Port Belgrano.

Lower Toro Bank.

Lobos Bank.

Between Bahia Blanca and Falsa Bay lies the Lower Toro Bank and the Horn Spit, which is very suddenly steep at its North-east side: and then the Lobos Bank, which extends nearly North and South to the parallel of 39° 20′. To the Westward of these banks the land is so low that it is visible only from aloft.

Green Bay and Island.

Brightman Inlet.

Next to Falsa Bay is Green Bay, and between them are some large banks. Westward of Green Bay is Green Island, with banks lying off its South-east end. Between Green Island and Laberinto Head is Brightman Inlet.

Colorado River.

From 3 miles South of Laberinto Head, or from latitude 39° 30′ to the mouth of the Colorado River, inlatitude 39° 51½′, the coast runs directly South, and is quite free from obstructions, or dangers of any description. The water shoals gradually, and regularly, therefore a vessel may go by her lead and close the land as much as she thinks proper. The land is low. A range of sand-hills, between 30 and 40 feet in height, extend parallel to the high-water mark. The beach is sandy, and in some

places runs off more than a mile at low-water. It has neither opening nor break of any kind.

At the entrance of the Colorado River the sand-hills end abruptly, forming a low but distinct headland. The Sauci (a kind of willow) trees show themselves as you open the river. They are the only trees of this or any other kind on this part of the coast. From the Colorado the land is very low until near Indian Head.

Indian Head. Indian Head cannot be mistaken, being a bluff 25 feet high, rising from very low land, which nowhere exceeds 20 feet in height above the sea, and is in many places almost level with the water at ordinary spring-tides.

Starve Island. From seaward Starve Island, and perhaps a part of the South-west side of Union Bay, may be seen at the same time as, or soon after, Indian Head.

Serpent Bank. Off Indian Head is the Serpent Bank, extending 4 miles to the Eastward, and with more water over it to a greater distance. Between Indian Head and Starve Island is Union Bay, a good harbor for vessels drawing less than 17 feet water. The Serpent is the first of the extensive flats and shoals lying between the Colorado and San Blas Bay. They extend to the Eastward and Southward, from 10 to 15 miles from the land.

Anegada Bay. This portion of coast, lying between Indian Head and Rubia Head, is appropriately named Anegada (lowland overflown) Bay.

Prodigious sand-banks, as level as the water, extend beyond eyesight soon after the first quarter ebb. At high-water very little dry land can be distinguished, even from the mast-head. Every vessel, large or small, should give these shoals a wide berth; more particularly when going Northward. They extend to the South-east Southerly, the flood-tide sets up between them to the North-west Northerly. In steering to the Northward during the flood, a vessel will probably be set towards or amongst the banks; and if so hampered she will have great difficulty in extricating herself.

Shoal water probably on each side, the tide setting 1, 2, or 3 knots towards the danger, and with a Southerly wind, no resource left but anchoring.

In this case it is probable that she will not be able to haul off to seaward, because banks extend in parallel ridges on each side. These ridges are very numerous, all lying North-west Northerly and South-east Southerly; upon them from 2 to 6, and between them from 8 to 12 fathoms water.

Between the parallels of 40° 5′, and 40° 35′, a vessel might run aground so far from the land that it could hardly be seen from the mast-head in the clearest weather. Between those parallels the banks extend from 10 to 15 miles to the Eastward. Their length North-west and South-east is much greater. Some parts are more suddenly steep than others. The water over them is always more or less discolored. When there is a swell the breakers are high and the ground-swell on the banks is sufficiently distinct to show their position. There are no rocks.

Viper Bank. The Viper Bank, and the tail of the Snake, with their accompaniment of parallel ridges, are extremely dangerous. In going towards the South there is less danger if the lead is carefully attended, because you will naturally find the water shoaling upon an outside bank first, and may haul off to seaward when you please; besides the dangerous tide, that of flood will probably be a weather-tide, while it is running. The quality of the soundings, as before mentioned, must be strictly watched, and the time of tide borne in mind.

Southerly winds, particularly if strong, raise the flood-tide, causing it to run half an hour or an hour longer, and with more strength. Strong Northerly winds have a diminishing effect upon the flood, but they make the ebb run stronger, and cause the water to fall unusually.

Creek and Deer islands. While passing these banks, Creek Island and Deer Island may be seen from the mast-head if the weather is clear, but it is better to keep so far off as not to see land at all.

If the land is seen between the parallels of 40° 5′ and 40° 35′ the vessel is in a more or less dangerous situation. There are always breakers near the edges of the banks even in a calm; but on the dangerous ridges, where are only 2 or 3 fathoms, there are no breakers in fine weather. A slight rippling, or an unusual smoothness, and some difference in the color of the water, are, with the soundings, the only warnings of these dangers. When there is much swell the whole extent of the banks is shown, even where there are 4 or 5 fathoms water over them.

Between the North-east sands of San Blas and Rubia Head are small banks, narrow channels, and strong tides.

Rubia Head. Rubia Head is the North end of the land which now takes the place of the low islands and extensive sand-banks in Anegada Bay. It is still low, only 30 feet above the sea. *Rubia Point.* Rubia Point is a little higher, 40 feet. The coast between and on each side of them, and Southward to the River Negro, is a line of sand-hills, few as high as Rubia Point, here and there partly covered by rough grass, and by low prickly shrubs. No hills appear inland, until you approach the River Negro.

Raza Point will be recognized by the trend of the coast, as well as by three or four flat-topped sand-hills. *Raza Point*

From Rubia Point to the bar of the River Negro the coast may be more closely approached. There are neither shoals nor rocks when one mile from the beach. The lead may be trusted.

The tide sets strongly from 2 to 5 knots, following the coast's line nearly six hours each way. *Tides.*

As the River Negro is approached, the sand-hills are lower; some hills of a different character just show themselves inland.

At Main Point, on the North side of the river, the land rises a little, to 40 feet. The point makes in three hummocks, tolerably covered with verdure; on one of them is a flagstaff. *Main Point.*

Around Main Point, to seaward, are the breakers on the bar; beyond it to the Southward, is lower land, on the further side of the river, which extends about a mile, to the comparatively high and extensive range of cliffs called the South Barranca.

The River Negro separates the provinces of La Plata and Patagonia.

THE COAST FROM THE RIVER NEGRO TO THE STRAIT OF MAGELLAN.

THE South Barranca range of hills extends from the River Negro to Belen Bluff, in the Gulf of San Matias, with only a slight interval, that of Rosas Bay. Their utmost height (near Belen Bluff) is 300 feet. At their beginning, near the River Negro, they are 200 feet above the sea. Thence, nearly to Bermeja (red) Head, erroneously called by many Cape Two Sisters, the low land above and inshore of the cliffs is so extremely level as to appear parallel to the water-line when seen from the South-eastward. *Bermeja Head.*

Near Bermeja Head there are hummocks and irregular hills, nearly covered with rough verdure. At the North-eastern part of these heights are two peaks, very small, yet showing distinctly when seen from the Eastward.

They stand nearly over two peculiar cliffs, which so much resemble one another that they have obtained the name of the Two Sisters (or Dos Hermanas). *Dos Hermanas.*

The bar of the River Negro is the only outlying danger on this part of the coast, or, between San Blas Bay and Port San Antonio. The banks off each of those places excepted, the intervening coast is quite clear.

As far as Belen Bluff, soundings in from 10 to 20 or 25 fathoms will be found from 1 to 20 miles from the land. Everywhere there is a clean sandy or gravelly bottom. Bermeja Head is an excellent point to make when approaching the River Negro, the Bay of San Blas, Port San Josef, or Port San Antonio. It will keep a vessel clear of numerous dangers which attend the approach to either of those places on a parallel, as is the frequent but, on the coast, dangerous practice. It is dangerous on account of the tides, the lowness of the land, and the extensive banks. *Belen Bluff.*

Thirty miles to the Eastward of Bermeja Head, you will have only 20 fathoms water (a fathom more or less.) Twenty miles to the Southward, the same bank extends.

Westward and Southward of Belen Bluff, there is a ledge of rocks with less than 13 fathoms over them. The water appears light-colored.

In all other parts of the Gulf of San Matias there is deep water; from 30 fathoms when a mile or two from the shore, to 80 fathoms in the offing.

West of the meridian of Norte Point, and Northward of latitude 41° 50′, but little stream of tide is felt; though the water rises 4 fathoms perpendicularly. Round Norte Point and thence to the bay of San Josef, the tide sets strongly, with ripplings and races, dangerous for boats, or very small vessels. From Belen Bluff it sets strongly to the Eastward along shore with the flood and but faintly to the South or South-eastward during the ebb. Westward of Belen Bluff the flood-tide sets to the North-west, the ebb to the South-east. *Tides.*

The tide-wave, coming up the coast from the Southward, rushes round the projecting land of San Josef with much strength, causing violent and dangerous overfalls off Valdes Creek, and off Norte Point. Part of the body of water goes round Norte Point. The main body continues Northward, inclining to the West, until near Belen Bluff, when it divides: one stream running to the North-west, the other to the Eastward along the land. With the wind against the tide, there is a very cross short sea in the entrance of the gulf.

Tide Creek. Ten miles West of Belen Bluff, there is a tide creek in which there are 3 or 4 fathoms at high-water, but at low-water it is dry.

West of that creek, another range of cliffs begins. This range, which is about 100 feet in height, and with one break, extends about 18 miles. To the cliffs succeed low land, with a shingle beach. Near and inshore of the cliffs, to the Westward of Bermeja Head, are irregular ranges of hills, tolerably covered with rough verdure. Where there are no cliffs, the land is low and without hills. Rosas Bay and Tide Creek appear, when first made from seaward, like openings in the land. The hills and cliffs on each side show like islands or headlands.

Lobos Bank. In the North-west bight of the gulf there is no danger, either near the shore, or outlying, except the Lobos Bank. Deep soundings may be had anywhere, and when only a few miles from the land, soundings will be obtained with the hand-lead.

From Cliff End to Villarino Point the land is low, a few banks, partially covered with grass and stunted bushes, or low sand-hills, alone rise above the shingle beach. At high-water mark, the beach is either shingle, or coarse sand. At half-tide it is composed of large shingle stone; at low-water tosca and rock are mixed with large stones.

Villarino Point. Villarino Point is low and sandy. Some little hummocks upon it are covered with rough grass and straggling bushes. Before seeing Villarino Point, the land to the Westward of Port San Antonio, and perhaps the range of hills lying to the Northward of it, will be distinctly made out.

Direction Hill. Direction hill, or the Fort, will first appear according as you are more to the East or to the South.

Sierras de San Antonio. Continuing along the coast Southward from the fort, the Sierras de San Antonio attract notice. The highest part of this range of hills may be about 1700 feet above the sea. It is peaked, and visible from a ship's deck when 20 or 30 miles from the land. There are several ranges of hills in irregular succession. Amongst these hills are ponds and streams of fresh water; but the steep and exposed nature of the shore renders it impracticable to use them for ship purposes.

All this West coast of San Matias is bold and steep to. From the point of the Sierra, to the Southward, the coast is chiefly cliffy, but with intervals of low land. The cliffs are moderately high, from 100 to 200 feet nearly perpendicular. They are composed of loose earth, or diluvium, but mixed with shingle and vast quantities of fossil shells. At high tide the shore is sandy; at low-water it is rocky.

Port San Josef. On each side of Port San Josef are bold, cliffy headlands, with deep water to seaward; but a shoal ledge runs from one to the other under water. From the East side of Port San Josef to Norte Point, there is a continued cliff from 60 to 100 feet in height. No high land appears inshore; all looks low, bare, and sun-burnt. No danger lies under water; to small vessels the races of tide which are sometimes met between San Josef and Norte Point, are rather troublesome, if not dangerous.

Tide Race. The races to the Eastward of Norte Point and Valdes Creek are yet worse. But the height and violence of these overfalls, races, or ripplings, vary as much as the winds and tides by which they are occasioned. Norte Point (by some called Lobos Point) is lower than the adjacent cliffs, and a reef extends under water about a mile. It is rocky and unfit to approach nearer than that distance. In the offing is deep water.

From Norte Point to Valdes Creek the land is low, mostly a shingle beach, and off this piece of coast are the worst tide-races; being occasioned by the rush of water across shoals, and rocky patches lying from 2 to 10 miles off shore to the South-eastward of Norte Point, and to the N.N.Eastward of Valdes Creek.

There are no marks on the land by which the shoals can be avoided. The strength of tide is so great as to render the sails of doubtful effect. It is, at least, prudent to avoid going nearer to this shore than 15 or 20 miles. Sometimes the overfalls extend 15 miles from the land; sometimes they are hardly 5 miles distant; their locality depending upon wind and tide.

Valdes Creek. The entrance of Valdes Creek may be known by the shingle beach ending, and by a line of cliffs commencing at Cantor Point, on the South side of the creek, and continuing to Ercules Point.

Cantor Point. At Cantor Point the cliffs are low, but they increase in height to 220 feet at Ercules Point. There are no heights inland which can assist in showing a ship's place.

Ercules Point. Ercules Point is a high white cliff: when first seen it appears to be perpendicular, or rather overhanging. When near, the upper and lower parts of the face of the cliff meet at an angle near the middle, resembling the back of the letter K. Close to the Northward of it are two perpendicular cliffs of the same height, off which a shoal ledge of tosca extends 2 miles to seaward, and 3 miles along shore.

Delgada Point. Delgada Point is sloping and green, and is 200 feet above the water. A tosca ledge runs to the Eastward 1½ mile.

Lobo Peak rises only 15 or 20 feet above the table range. It appears from the Northward like a small peaked sand-hill; but from the Southward it appears double; a smooth round-topped sand-hill to the Northward, with a peaked one close to the Southward of it. A rocky ledge off this point extends about a mile to the South-east. *Lobo Peak.*

Near all the cliffy points between Valdes Creek and Nuevo Gulf, there are rocky ledges extending nearly a mile from the high-water mark. In some places they extend still further, and should be allowed a berth of 2 miles. On the outer part of some of these rocky places there are not more than 2 fathoms water.

The upper outline of the portion of coast between Cantor Point and Nuevo Head is nearly horizontal.

Nuevo Head is bold. Its vicinity is free from danger, a few tosca ledges close to the shore excepted. *Nuevo Head.*

Ninfas Point is bold to the eye, but there are some rocks and tosca ledges extending towards the East and North-east. At the North side of the point there is a reef running to the North-east nearly 2 miles. One mile and a half from the shore there are rocks, dry at low-water, with 7 fathoms close to them. The tide rushes over these rocks at the rate of 5 or 6 knots, causing heavy and, for a small vessel or for an open boat, very dangerous ripplings or races. *Ninfas Point and Reef.*

There are good anchorages, wood, and water in Nuevo Gulf. *Nuevo Gulf.*

From Ninfas Point the coast runs nearly straight to Engaño Bay. This straight shore is cliffy, and similar to the coast Eastward of the gulf. There is no outlying danger. The tide runs North-east and South-west, nearly in the direction of the shore, from 1 to 2 knots.

In Engaño Bay the water is shoaler than near the higher land. Around this bay, between North and South Cliffs, the land is low and sandy. Many small sand-hills or hummocks appear near the beach. At the South-west corner of the bay, where the low and sandy hummocks end and the cliffy shore again begins, is the little river Chupat. Southward to the mouth of the river is a range of table-land, from 50 to 60 feet in height, ending in very white chalky-looking cliffs. *Engaño Bay. River Chupat.*

Castro Point is the North-east termination of this table-land. The entrance of the river is partly concealed by a ledge of rocks which crosses and, at low-water, quite hides it from view. *Castro Point.*

From Castro Point to Delfin Point, and thence to Lobos Head and Union Point, the coast is high and bold. The water near it is deep and free from danger. The cliffs hereabout have a chalky appearance. They consist of very light-colored sand and clayey earth, with horizontal strata of a dark color.

At Delfin Point a small conical hummock is seen above the table-land. This hummock appears double, saddle-shaped, and rugged, when seen from the Northward. *Delfin Point.*

Eight miles South of Delfin Point is Hidden Islet, and so much like the cliffs near it that one might easily run past, even if looking out, and only a mile or two distant, without seeing it. *Hidden Islet.*

Union Point is rather low and rocky. Here the character of the coast changes. Bold cliffs and extensive ranges of table-land no longer meet the eye, the shore becomes lower and more uneven. *Union Point.*

Tombo Point is low and rocky. Its outline is very rugged. For a quarter of a mile from the sea it is quite bare, rocky, and dark-colored. There are some rocks and a rocky ledge extending half a mile to the North-eastward. *Tombo Point.*

On the North side of the point, inside the reef, there is an anchorage where small craft might find shelter from South-east winds. Sealers anchor there at times.

Atlas Point, the Northern head of the bay of Vera, shows a smooth slope, terminating in a low rocky point, when seen from the Northward or Southward, but in a rugged ridge of rocks, if seen from the Eastward. There are rocks under water near, within 2 cables' length of the extreme point. *Atlas Point. Vera Bay.*

One mile South-west of Atlas Point is an anchorage fit for small craft drawing less than 12 feet. It is formed by a reef of rocks lying South-west and North-east nearly a mile in length, and half a cable's length broad. You may enter in a vessel drawing less than 12 feet from the North-east or from the South-West. In each entrance the bottom is rocky and uneven, and there are only 12 feet at low-water in them. Inside, opposite the shingle beach, is a good berth in 15 feet at low-water, over a bottom of coarse sand, shells, and sandy mud.

The tide sets through, between the reef and the shore, about a mile an hour. *Tides.*

The land is low, close around the bay of Vera; but rather high ground is seen inshore. Two islets with rocks near them lie nearly in the middle of the bay.

Cape Raso is level and rather low. There are few rocks close to its extreme point. Two miles North-west of Cape Raso is Raso Cove, a good anchorage with all winds, excepting those between N. by W. and N.E. The cove is free from impediment of any kind; but on the East side the ground is hard and stony. In the middle, and near *Cape Raso. Raso Cove.*

the West side, there is good holding-ground, a stiff yellow clay. Sand is shown by the hand-lead, but underneath is clay. There is neither fresh water nor any fire-wood, excepting a few straggling bushes.

Salaberria Reef. South-eastward of Cape Raso is the reef of Salaberria, extending 8 miles North-eastward from Cape San Josef.

Cruz Bay. Westward of the rocks of Salaberria is the bay of Cruz, in which there may be good and well-sheltered anchorage.

New Cove, close to the Northward of Cape San Josef, is small and exposed to East winds. West Cove has not been examined.

Camarones Bay. The shore of Camarones Bay is rocky as far as Fabian Point, where it changes to shingle, and so continues as far as Cape Dos Bahias. Along this shore, and especially along the headland, the tide runs strongly from one to three knots, nearly N.N.E. and S.S.W. It rises from 8 to 12, sometimes even to 15 feet.

Tides.

Cape Dos Bahias. A ledge of rocks extends a mile to the N.E. of Cape Dos Bahias. It should be carefully avoided.

Moreno Islet. Moreno Islet, 2 miles North-west of Cape Dos Bahias, and a third of a mile off shore, is high and rocky. It is of a dark color. In the depth of Camarones Bay, 11 miles from Cape Dos Bahias, there is a high rocky islet, with two lower and smaller ones to the Northward, all of which are perfectly white. Their whiteness is caused by numerous sea-birds.

Blanca Islets.

Gregorio Cove. From Cape Dos Bahias to Gregorio Cove the coast is bold and steep to, without an anchorage. Excepting Rasa, the islets in the offing are not dangerous, being rather high, from 80 to 100 feet, with deep water near them.

Gregorio Cove is exposed to South-east winds. It is somewhat difficult to enter, because of the strong tides setting past. From the prevailing winds there is good shelter.

Rasa Islet. Rasa Islet is dangerous, because it is so low and so far from the land; the water round it is deep, excepting at the South side, where there are some rocks near the islet. They extend rather more than a mile.

Leones Isle. Leones, or Ship Island is high and bold. It is about 100 feet above the sea. There is a snug anchorage at the West side, between it and Harbor Island. The entrance to this cove, called Leones Cove, is from the Northward, midway between the islands. The tide sets directly through, causing eddies, which are strong enough to turn a ship round at her anchors against a strong breeze. This and the strength of the tide setting between the isles and the main-land are objections to anchoring here; yet the bottom is good, and there is generally a small stream of fresh water upon Leones Isle.

Leones Cove.

San Roque Point. San Roque Point is low and rocky with a hummock upon it. While the flood-tide is running, a vessel ought to give it a good berth, as the tide sets rather towards it. There is no other danger in the passage between Leones and the main.

Tides. The flood-tide sets to the N.E. Easterly, 3, 4, or 5 knots.

Cape del Sur. From San Roque Point to Cape del Sur, or South Cape, the tide sets to the Eastward during the flood, passing the latter at the rate of 3 knots, and causing much rippling. In the bight to the Northward of Cape Sur is the Oven, a concealed dock-like cove.

Port San Antonio. At the West side of that cape, between Valdes Island and the main, is the little port of San Antonio.

Gill Bay. Gill Bay is formed by Cape del Sur and the North shore. There is anchorage in the bight to the South-west, in 8 fathoms at low-water. Southerly gales send a heavy swell into Gill Bay, as well as into Port San Antonio. Cape Sur makes as an island when seen from the Eastward, the isthmus being very low.

Cayetano Islands. Between Cayetano Islands and the main-land is a bight which appears to offer anchorage and shelter; but it is unfit for any vessel.

Frayles. At low-water the Frayles show as three distinct rocks. At high-water there are always breakers upon them. They may be closely approached on either side.

Pan de Azucar. The isle called Pan de Azucar does not resemble a sugar-loaf: its summit is uneven and rocky, rising to 190 feet above the sea. There are rocks close around, and dangerous ones between it and the reef of San Pasqual. To the Northward of the Westernmost of these out-lying rocks, off its Eastern and Western extremities, there is anchorage under the island in 7 or 8 fathoms over a muddy bottom. This anchorage might answer for a vessel wishing to enter Port Melo and waiting for the tide.

Anchorage.

Tides. The tides here are strong, running along the land 2 or 3 knots. Off the projecting points and in confined passages their strength is of course increased, and causes heavy ripplings, when opposing the wind.

Port Melo. Port Melo is too rocky, and too much exposed to Southerly winds to be valuable as a port. Off it are several rocks, lying in a direct line between San Pasqual or Molino Reef, and Pan de Azucar.

From Point Castillos to Cape Aristazabal, are several bights and coves, though none of them are worth notice as fit places for anything larger than a decked boat.

Tova Island.

Tova Island is large and bold: at the North-east side of it is Tova Cove, a good anchorage for vessels drawing less than 15 feet. In entering, avoid the reef on the starboard hand, and close the opposite shore, which is steep to. You may anchor in 5 fathoms, muddy bottom, sheltered from all winds excepting Northerly, which cannot raise much sea, as the main-land to the Northward is so near, and a strong tide is always setting through, between the island and the main. On Tova there is abundance of excellent fire-wood, and, in general, water may be procured.

Robledo and Medrano Rocks.

The Robledo Rocks, and Medrano Shoal, lie South-eastward of Tova, and must be carefully avoided. The Medrano is a mere reef, but so far outlying, is very dangerous. At most times, the sea breaks upon it with violence.

Lobos, Galiano and Viana Isles.

The Lobos and Galiano Isles are beset with rocks. The Viana Isles have a reef 1½ mile to the Eastward of the largest, on which the sea generally breaks. In other directions they may be approached with safety.

Bustamante Bay.

Bustamante Bay is very open, and exposed to the South-east winds; several rocks lie near the middle.

Port Malaspina.

Port Malaspina is a mere rocky inlet, unfit for anything except a boat. Upon this coast, which forms the North side of the bay of St. George, a Southerly gale drives a very heavy sea. The land has everywhere a barren desert appearance, destitute of trees or any verdure. In height it is generally between 100 and 300 feet. No mountains are visible.

Cape Aristazabal.

Off Cape Aristazabal the flood-tide sets to the North-eastward about 2 knots; with the ebb it runs to the Southward. There is deep water close to the cape, excepting at three-quarters of a mile to the South-east, where there is a rocky place which causes breakers at half-tide.

Quintano Isles.

From Cape Aristazabal to Cordova Cove, the land gradually rises. A range of table-land is seen increasing in height, as it extends Southward. There is no danger of any kind between these places, excepting a rock off the Quintano Isles. The soundings are regular, the tides scarcely felt, the coast steep to, and bold.

After passing the Quintano Isles, high light-colored cliffs bound the sea; they continue nearly as far as Cordova Cove.

Salamanca Peak.

Salamanca Peak is remarkable. It is visible 40 or 50 miles distant. It is a regular-shaped cone, and shows itself distinctly above the high ranges of table-land.

Cordova Cove.

Cordova Cove is rocky and shallow, almost unfit for the reception of any vessel. From the Northern point of the cove, a reef extends half a mile. Two miles N.E. of the point lies the Novales Shoal, a small rocky ledge under water. There is also a ledge of rocks directly East of the cove, and to the South-east of the North point. Five miles Southward of Cordova Cove, and one mile off shore, are the Ali Rocks; dry at low-water, and having breakers on them when covered. There is no other outlying danger between Cordova Cove and Cape Tres Puntas.

Novales Shoal.

Ali Rocks.

Tilli Road.

Tilli Road is a tolerably good anchorage during Westerly winds. The beach is level and sandy, but so much swell generally breaks upon it that landing is difficult. There is plenty of small fire-wood near the shore, and a *Salina* of fine white salt. From North to South, by the East, Tilli Road is quite open. The anchorage is in 5 or 6 fathoms water, over a clean sandy bottom. The heights near this shore are composed of a sandy light-colored diluvial earth, and great quantities of fossil shells, principally oyster-shells of a very large size. The position of Tilli Road may be recognized by its lying between the second and third prominent bluffs, which are seen to the Southward of the lower land about Cordova Cove.

Cape Murphy.

In the depth of the Gulf of St. George, from Tilli Road to Cape Murphy, the shore is low; generally a shingle or sandy beach, without cliffs or rocks. The soundings in the offing are regular. Cape Murphy is a cliffy bluff. Thence to Casamayor Point, the shore is rugged and broken.

Espinosa Heights.

Very little cliff is seen until you reach Casamayor, where the land again rises into a high ridge, fronted towards the sea by precipitous cliffs. This ridge is called the heights of Espinosa. Thence to Cape Tres Puntas the coast is alternately cliff, rock, sand, or shingle, in discontinued portions.

Cape Tres Puntas.

Cape Tres Puntas may be known from seaward, by observing that it is the termination of a long level range of table-land running nearly North and South. A little to the South-east of the Northern end of that range is a remarkable conical hill, like a sugar-loaf, attached to the main range, though rather a straggler; and there is a small sharp peak rather Northward of the fall of the range.

Cape Tres Puntas shows three distinct upright heads of a light-colored earthy cliff. Off these heads are ledges of rocks, extending half a mile to seaward. Over them the tide rushes and ripples with violence. One mile from the shore there is no danger whatever.

From Cape Tres Puntas to Cape Blanco the coast is low and rocky, with table-land showing inshore. A thick bed of kelp lines the rocky coast. Salinas (salt lagoons or marshes) extend for many miles inshore of these points.

Cape Blanco. When at a distance, Cape Blanco appears to be an island. Three distinct masses of rugged rock 130 feet high are connected to the main-land by a narrow low isthmus. On each side of the isthmus is a small cove. That on the South side is sheltered excepting from South to East. A very small vessel might obtain tolerable shelter from all winds, by anchoring close to the end of the kelp, in the North-east corner of the cove.

A vessel intending to anchor here should make great allowance for the tide. The flood sets with great force over the bed of rocks, which lie half a mile North-eastward of the cape. They would prove extremely dangerous, if drawn in among them. The beach around the cove is rather steep, and formed of shingle, here and there mixed with dark sand. The depth is from 4 to 6 fathoms. Plenty of excellent fire-wood, of a small sort, may be cut on the South-west side of the cove, a few yards only from the beach. There is no appearance of fresh water. From the summit of the cape, patches of shoal water are seen towards the N.E. and S.E., some 10 or 12 miles off shore. On and about them are ripplings and overfalls, more or less violent according to the time of tide, and the direction and strength of the wind.

Fire-wood.

Over these shoals there is but little water in many places, and the soundings are very irregular. A ship should entirely avoid them.

From Cape Blanco Southward, the land is low, and the beach regular, until near Port Desire, when it rises into a remarkable bluff.

Tides. It should be borne in mind, when approaching any part of the coast between Union Bay and Port Desire, that there is a difference of half a tide, or three hours nearly, between the turn of tide in the offing and high-water, or the turn of tide in the harbors. Three hours after high-water in the harbors, or rather upon the shore, the tide ceases to run to the Northward, and begins to run in a contrary direction. Also 3 hours after low-water on the shore, the tide turns in the offing.

Cape Blanco Shoals. There are several shoals off this part of the coast, which, at low-water, would doubtless be dangerous. His Majesty's ship Adventure passed over two of them, 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.

Byron Shoal. The North and South ends of the Byron Shoal bear respectively from Cape Tres Puntas and Cape Blanco, E.N.E. ½ E., distant from the former 7 miles, and from the latter 5 miles; consequently it extends in a N.W. ½ N. and S.E. ½ S. direction for 6 miles; it is scarcely a quarter of a mile wide.

Anne Shoal. The North end of Anne Shoal bears E. ¾ N., 7 miles from Cape Blanco, and extends in nearly a Southerly 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 these shoals are two others: a small one with 2 fathoms on it, bearing E. ½ S. from the cape, and distant 2 miles; and another 2-fathoms bank, which has been named after the Susannah cutter which struck on it. It is 2½ miles in length, and nearly a mile broad; its direction is S.S.E. and N.N.W., and its Northern end lies 3½ miles S.E. by S. from Cape Blanco. There is probably more shoal ground to the N.E.; for in the year 1829, having approached the land within 14 miles of Cape Tres Puntas, bearing S.W. ½ S., the depth rather suddenly decreased from 40 to 14 fathoms, pebbly bottom, being then about 10 miles within the 50-fathoms' edge of the bank. On approaching the land, the quality of the bottom becomes irregular, and changing from ooze to sand, with pebbly shoal patches; 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 Tres Puntas, which is visible from the deck, about 20 miles on the horizon.

Tides. The flood or Northerly tide ceases in the offing at 4h. 15m. 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.

Coast between Cape Blanco and Port Desire. The coast line between Cape Blanco and Port Desire was imperfectly seen; within the distance of 3 to 5 miles from the shore 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 to not less than 15 or 14 fathoms; within that limit the ground is foul. To the Northward of Port Desire the land is low, with a shingle beach, except for the first 3 miles, where it is high and cliffy. The North Point of entrance of the port is a steep bluff, and is therefore remarkable as being the only point of that description along this part of the coast. At 4 miles N. by E. ¾ E. from that bluff there are some rocks, called Sorrell Ledge, a quarter of a mile without

Sorrell Ledge.

which the depth is 13 fathoms. The Tower Rock, on the South side of the coast, becomes visible after passing this ledge; it opens out when the North bluff bears S. W. ½ S. A ship bound to Port Desire, or merely wishing to anchor in the bay which fronts it, may procure a good berth in 7 fathoms, at low-water, well sheltered from N.N.W. to S.E., with the North Bluff bearing N.W. ½ W., and Tower Rock W. ¾ S. This situation being a little to the Southward of the fairway of the port, and about 1½ mile from the nearest shore, is quite out of the strength of the tide. The bottom, however, 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 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; 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. *Penguin Island. Tides.*

Sea Bear Bay is one of the best anchorages on the coast, but it is difficult of access without a leading and 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; and the bottom there is not only 20 to 30 fathoms deep, but very foul and rocky; so that 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. *Sea Bear Bay.*

The South point of Sea Bear Bay is in 47° 57′ 15″ S., and 65° 45′ 40″ W.; variation 20° Easterly; high-water, at full and change, 12h. 45m., and the tide rises 20 feet. *Tides.*

Spiring Bay is contained between the South head of Sea Bear Bay and the point within the Shag Rock; it forms a deep bight, but is much exposed, being quite open to the South and East; and at the conclusion of a South-west 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. *Spiring Bay.*

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 San 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.

A reef of rocks is said to exist about 10 miles E.N.E. from the Southern point of Spiring Bay. The position of the reef, according to the same report, is about 48° 7′ S., 65° 37′ W.

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 parallel with the shore.

The Shag Rock is a whitish mass of rock, perfectly bare, lying about 1½ mile off Hilly Point; 2 miles to the Southward of it there are four small dark-colored rocks; and a mile further there is rather a large rocky islet. *Shag Rock.*

On the land, and at a short distance from the coast, there are three hills, which appear, when a little to the Southward of Sea Bear Bay, to be round-topped, but on reaching more to the Southward, they extend in length and form into two hills, and when 3 leagues to the Southward of the Shag Rock, they appear to form one mass of table-land.

Cape Watchman is very low, but may be distinguished by its bell-shaped mount; at 2 leagues from the point there is a shoal with kelp on it, and only 3 fathoms water. There are also many other shoal patches, but all are buoyed with sea-weed; the ship passed between several in 7 and 9 fathoms. *Cape Watchman.*

To the Northward of Cape Watchman the shore falls back into a bight, called Desvelos Bay, which offers good shelter from Westerly winds; but in approaching or quitting it, due allowance must be made for the tides, which sweep along the shore from 2 to 3 knots. *Desvelos Bay.*

The ground is very foul for more than 4 miles from Cape Watchman, and is so uneven that the tides ripple much. Though no positive danger has been discovered, it would always be prudent to give the cape a wide berth, and pass to the Eastward of the Bellaco. When the cape has been passed, a hill will be seen to the N.W. of it.

Monte Video. somewhat resembling Monte Video, in the River Plata, both in shape and color, but not quite so high; it also is called Monte Video, and is in 48° 13′ 40″ S., and 66° 25′ 50″ W.

Bellaco Rock. The Bellaco Rock, or the San Estevan Shoal, is in latitude 48° 29′ 20″, and longitude 60° 12′ 15″. It bears 10½ miles S. 40° E. true, or nearly S.E. by E. ¼ E. magnetic, from the extremity of Cape Watchman, and S.E. ¼ E. from Monte Video. The rock is a dark mass, about 6 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 are 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.

Lookout Point. From 4 miles to the Southward of Cape Watchman to Lookout Point the land rises and the coast is safer; but 5 miles to the Eastward of Lookout Point, there is a large patch of foul ground with much kelp. The land still rises, in advancing to the Southward, till it attains the height of above 600 feet, and is then remarkable for its horizontal outline.

Flat and Bird Islets. Flat and Bird Islets, though low, are too near the land to be dangerous to vessels that keep a fair offing.

Dañoso Reef. Nine miles to the Southward of Flat Islet, and off the high table-land of Cape Dañoso, a dangerous reef projects 3 miles from the shore to the South-eastward, but it does not appear to be steep to.

Port San Julian. From thence to Port San Julian, there is no known danger; and Mount Wood, and the above-mentioned long range of horizontal land, show so far out to sea, that they are unfailing guides for making that port.

When Mount Wood bears W.S.W. ½ W., it is in a line with Desengaño Head, the South point of the entrance, which may be distinguished 6 or 7 miles or more, according to the state of the weather. The North point of the entrance, 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.

The land to the Southward of Port San 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 Eastward, a small flat-topped hill is seen over the low coast hills.

In latitude 49° 29′, the character of the coast changes to a range of steep white clay cliffs, the average height of which is about 315 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 several 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 perceivedwhen passing abreast of them.

Anchorage off the coast. Anchorages along the coast may be taken up with the wind off shore, at from 1 to 2 miles from the beach, and in from 9 to 14 fathoms, oozy bottom. In latitude 49° 58′ the range of steep white cliffs begin gradually to diminish in height, and terminate at 9 miles further 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 50° 5′ 20″ S., and 68° 3′ W.

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 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 356 feet high; the low land is on the Northern side of the entrance of the river.

Tides. Well up the harbor the spring-tides rise 42 feet, and run sometimes 6 knots. The neaps rise only 18 feet, and with a much more moderate velocity. In the offing the tides flow regularly 6 hours each way, but turn 2 hours later than the time of high-water inshore. The flood, as before, runs to the Northward.

The harbor and river of Santa Cruz will be more particularly described in the following chapter.

The coast to the Southward of Santa Cruz 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 3 miles.

Between Santa Cruz and Coy Inlet the coast trends in, so as to form a considerable bight. It is a succession of cliffs 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. *Coy Inlet.*

When within 7 miles of its latitude, (50° 57′,) as well to the Northward as to the Southward, a ship should keep at the distance of 4 or 5 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 danger may ensue, from the ledges of rocks, which project at least 3 miles, and perhaps more, from the coast.

Coy Inlet is said to be a shoal basin of some miles in breadth at high-water, terminating 19 miles from the entrance, and fronted by a bar of rocks, leaving a passage of only 6 feet water; inside there are 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 seems to be 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 that to the Northward of the inlet, 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 100 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, takes place between 9 and 10 o'clock, and the tide rises 24 feet. *Tides.*

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. *Fresh water.*

Cape Fairweather is the Southern 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 Portugal, and appears to be of the same character as Cape Virgins, for which it has frequently been mistaken, notwithstanding there is more than 45 miles' difference in the latitude of the two headlands. *Cape Fairweather.*

On the old charts of this part of the coast the shore is said 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 300 to 400 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: guanacoes may be procured by lying 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. *Fresh water*

The entrance of the river and Port 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 bears from Loyala Point S. E., distant 10 miles. The passage in is parallel with the coast, taking care not to open the land to the Northward, the most Eastern trend of Cape Fairweather. The shore may then be gradually approached, but in the present state of the knowledge we possess, the ship should be anchored there in 10 fathoms, to wait low-water at 1½ mile from the shore, as soon as Loyala Point begins to be observed to trend round to the Westward; the anchorage there is good, and well sheltered from the prevailing winds. *Port Gallegos.* *Directions for entering.*

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. Anchorage may be taken up on the South side, for to the Northward the banks are extensive. *Anchorage.*

There is also a middle channel, which, as it appears to be the widest, may be the best for crossing the bar. The outer part was not examined, but no doubt there is a sufficient depth of water at three-quarters flood for any vessel to pass it.

The water of the river is fresh at 25 miles from the mouth. *Fresh water.*

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 5 knots. *Tides.*

Coast to the North of Cape Virgins.

From Port Gallegos 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, which, at a few leagues from the shore, is not visible, so that a stranger might readily suppose it to be the entrance of the Strait of Magellan. 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 will be visible, and in thick weather the soundings off the cape will be an infallible guide; for at the distance of 4 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 for nearly 5 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.S.W.

At 18 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, 8 miles North of the latter cape, a boat might land, if necessary. There is good anchorage along the whole coast between the Gallegos and Cape Virgins, at from 2 to 5 miles from the shore; but the bottom is rather stony, and might injure hempen cables. As the cape is approached, the ground becomes still more foul.

THE PORTS BETWEEN THE RIVER PLATA AND THE STRAIT OF MAGELLAN.

Port Belgrano.

THE first harbor after quitting the River Plata is Port Belgrano, in the Rincon, or Bahia Blanca; but it will be expedient, in order to show the way into it, to retrace a part of the coast which has been already described.

Sierra Ventana.

When to the Westward of the meridian of Asuncion Point, and between the parallels of 39° 10′ and 39° 20′, the Sierra Ventana will be seen if the weather is clear. The Sierra Ventana is a mountain 3,500 feet above the sea. Seen from the South-east, the summit appears peaked; seen from the South, rather square, with a notch in the middle. A good bearing of this mountain, (astronomical in preference to magnetic,) and the latitude of the ship, will fix her position with certainty.

Supposing that the weather is thick, that the Sierra Ventana is not seen, and that the reckoning is uncertain, the safest plan is to steer due North, with attention to the lead and the lookout, until the water shoals to 9, 8, or 7 fathoms, if the land is not seen previous to obtaining that depth. Reference to the chart and the reckoning will then show the ship's place very nearly.

Asuncion Point.

Asuncion Point is a projecting sand-hill, 120 feet above the sea, difficult to distinguish with certainty, although the most marked feature of this part of the coast. Being about 10 miles West of Asuncion Point, and 8 or 9 miles from the nearest part of the North shore, or in latitude 39° 10′, steer so as to make good a course between W.S.W. ¾ W. and W.S.W. ½ W., and a distance of 30 miles by the ground log.

The nearer a ship is kept to the parallel of 39° 10′ the better; not going Northward of it when between 40 and 10 miles East of the meridian of Mount Hermoso, nor South of it when less than 10 miles from that meridian. Excepting the Sierra Ventana and the North shore, no land is visible in the clearest weather. The North shore will appear low, just topping above the horizon of an eye 20 feet above the water. While visible, the Sierra Ventana is an excellent mark, and becomes more useful as you approach the Bahia Blanca.

Tides.

On the days of new and full moon, it is high-water in the Rincon, or great bight outside of Bahia Blanca, at 5 o'clock. In Port Belgrano it is high-water at 6. The tide sets along the North shore about one knot; the flood to the Westward near that bay; but to the Eastward, when off Asuncion Point. In the entrance to Port Belgrano, it runs between and parallel to the banks, nearly North-west and South-east, from 1 to 3 knots. The rise of the tide in the Rincon is from 6 to 8 feet. In Port Belgrano it is from 8 to 12, and at the extremity of the inlet from 10 to 14 feet is the usual difference between high and low water.

Toro and North Banks.

In approaching Bahia Blanca, the dangers to be chiefly guarded against are the two great shoals, the Toro and the North Bank. The banks are all hard: of fine brown sand, where they are steep and dangerous; of coarser and light-colored sand, where flatter and safer to approach. The Toro and the Eastern extremity of the North Bank are instances of the different qualities.

The fine brown sand, of a very dark color, generally lies upon tosca. In the channels between the banks, the bottom is everywhere soft—a dark, soft, sandy mud. On and near the banks it is everywhere hard. In the offing, when in the fairway, the ground will feel rather soft and sticky. Still further off, it is somewhat hard, being clay-covered by speckled sand, with broken shells.

The Great North Bank shoals very gradually, and may be approached by the lead in a large ship with safety. The Toro is the reverse. From the deepest water between the banks it shoals so suddenly that there is hardly time for the best leadsman to give warning. The Horn spit is particularly steep. From 7, 8, or at high-water nearly 9 fathoms, over a soft muddy bottom, you will shoal in two casts of the lead, or less, if going fast, to 2, 3, or 4 fathoms. *Horn Spit.*

Sometimes there are breakers on the edges of these banks; sometimes only ripplings. The Toro is generally more marked than the North Bank. Sometimes there is not a mark on the water by which they can be distinguished by a stranger. Generally the water in the channels is less discovered than that on the banks; but where all the water is extremely dirty and discolored, a few shades are hardly noticed. From the mast-head, in fine settled weather, the water in the channels will appear bluish, while that on the banks is muddy; but in windy weather the color is everywhere alike. Generally in fine weather the water is smoother on the banks than it is in the channels, where there is a slight tide-ripple. This is also the case with a fresh breeze at high-water; but at low-water, particularly with a breeze, breakers show themselves upon the banks in all directions. *Breakers.*

With or after South-east winds, as long as the swell lasts, there are breakers on all the banks, the highest being on the Toro.

A good azimuth compass, a sextant, the plan of the bay, and good leadsmen, should be turned to account in entering Port Belgrano.

A vessel should not go to the Westward of the meridian of Mount Hermoso before she sees the land, and sounds upon the edge of the North Bank. When near that meridian, it is best to steer due North until you get between 6 and 7 fathoms water over a rather soft clayey bottom: Mount Hermoso should then bear about North-west.

If the weather is thick, it is prudent to anchor, or stand to the South-east, for it is out of the question attempting to enter until you are certain of the ship's place.

Mount Hermoso bearing N.W., appears as a low rounded distinct headland. It is higher than the surrounding hillocks, excepting one small one, rather inshore. It is 120 feet above the sea, and at the summit is a pile of tosca, 10 feet square, raised by the Beagle's crew. There is a low cliff (Parrot Cliff) 12 feet in height under the mount: the only one upon the coast hereabouts. Mount Hermoso is close to the sea, and forms, when seen from the Eastward, a distinct finish to the Northern sea-coast. West of it, looking from the Eastward, the land appears much lower and more distant. When seen from the Southward, this little mount is confounded with the adjacent land, and by a stranger would hardly be made out, unless by seeing the Beagle's mark. *Mount Hermoso.* *Parrot Cliff.*

Having made out Mount Hermoso and sounded on the edge of the North Bank, alter your course entirely, and steer between S.E. and S. by E. (according to your position) to cross or round the North Bank. In doing this, if the water shoals, or you wish to get into a greater depth, South-easterly is the course upon which the depth will increase fastest. All the banks and ridges lie North-west and South-east.

When the greater part of the land is sunken beneath the horizon of an eye 20 feet above the water, you will have between 6 and 8 fathoms water, (according to the time of tide,) with a soft or sticky clay bottom. No land will be seen from the deck to the Southward or Westward. From the mast-head some bushes will be seen nearly West, apparently rising out of the water. They are on a low, flat, marshy island, called Zuraita Island. Those first seen are Laborde Bushes; afterwards some, more to the Westward, called Ryan Bushes, make their appearance. *Zuraita Island.*

It should be remembered that the tide is always setting strongly either in or out, excepting at the very few minutes of slack water; that the fairway is narrow; that the deepest water is close to the most dangerous bank, the Horn Spit, and that, if in doubt, an anchor should immediately be dropped. *Horn Spit.*

Supposing that you have rounded the North bank, and have between 6 and 8 fathoms water over a sticky bottom, steer N.W. by W., or from that to N.W., according to the wind and tide, until you again get hard casts and shoaler soundings on the South side of the North bank. Do not go into more than 6 fathoms water, or 7 at high-water, while steering Southerly, which will keep you from crossing the fairway and getting too near the Horn Spit. It is safest to borrow upon the North Bank, and not to go into the very deepest water at all.

Near the Horn Spit there are between 7 and 9 fathoms water over a soft bottom, but unless the edge of the Horn shows by rippling or breaking, it is rather too close to the deepest water.

Having run along the South side of the North Bank, and shoaled your water a little, one bearing of Mount Hermoso will show your position. Should you shoal too soon, keep more Westerly, and deepen again. When Hermoso bears N.N.E., steer one or two points more Westerly to find the end of the East Gate Post.

East Gate

The tail of this spit shoaling very gradually, is an excellent guide to the Gateway Channel, and a far better one than the Horn Spit, which shoals so suddenly.

When near the end of the Gate Post, you will see (if the weather is clear) Mount Hermoso, Texada Point, with its low, round, bare sand-hills; the Black Spot or Medano Mark, and the Laborde Bushes. Bearings of two, or angles between three of which will show the ship's position.

Black Spot, or Medano Mark.

The Black Spot, or Medano Mark, is a very singular hillock of sand close to the water, so covered with verdure as to look quite black, and well-defined among the other bare sand-hills. Behind it the land is rather higher than on any other part of the shore.

The Sierra Ventana may occasionally be used, but it is often clouded, and for so narrow a channel, such a distant mark is of little use, excepting in a line with one nearer. Its summit in one with the Black Spot, leads to the middle of the North end of the Gateway.

From the South-east end of the East Gate Post, Mount Hermoso bears N.E. by N.; Texada Point, N. ¾ W.; Black Spot, N.W. ½ N.; and Laborde Bushes, W. ½ N.

Having found this spot, (which, if the ship anchors, may be done by a boat,) pass on the South side of it in 5, 6, or 7 fathoms water, but not more, and steer along the South-west side of the East Gate Post until Mount Hermoso bears N.E.; then steer N.W. till Laborde Bushes bear S.W. by W. ½ W., the highest part of the dry Toro Sand, W. ¾ S.; Anchorstock Hill, W.N.W. ½ W.; Black Spot, N. ½ W.; Texada Point, N.E. ½ E., or Mount Hermoso, N.E. by E. ¾ E.

When either of these bearings are on, you will have passed the Gateway and be in Port Belgrano. Hence, W. by N., will lead up the harbor, and the plan will be a sufficient guide. Indeed the plan, the eye, and the lead ought to be trusted more than any written directions, for they cannot embrace all the contingencies of winds, weather, tides, and oversights.

When in the Gateway, the rippling on the East and West Gate Posts, or the smoothness of the water on them, and the rippling in the channels assist one much. At low-water many parts of both banks show by breakers, and sometimes quite uncover.

Anchorstock Hill.

Anchorstock Hill is the highest (57 feet) and most peaked of the hummocks seen to the North-westward; on it is a mark which looks at a distance like a mast.

For passing the Gateway, the besttime of tide is the last-quarter ebb, or the first-quarter flood. The banks show more distinctly; and if the vessel should touch the ground, the tide will soon lift her off. The dry part of the Toro Sand is a good mark when you are near the North end of the Gateway. The breakers upon the Toro Spit are also serviceable.

All the Northern shore from Mount Hermoso Westward is low; a succession of sand-hills, partly covered with shrubs and rough grass.

To go higher up the inlet and anchor off the Pilot's House, (or the Guardia,) it is advisable to weigh at the last-quarter ebb, and to anchor again before half-flood. When the banks are covered, it is difficult to find the way, but easy when they show themselves at low-water. At high-tide an unbroken extent of water is seen; when the tide is out, mud-banks, with narrow channels winding between them, meet the eye in every direction. Above Anchorstock Hill most of the banks are mud, mixed with fine sand; and in the creeks so soft in most places near the water that it will not support a man's weight.

Tides.

In Port Belgrano it is necessary to moor, because the tide runs strongly and rather irregularly. From 1 to 3 knots is the usual strength. South-east gales raise the water several feet; those from the North-west have a contrary effect.

The head of the inlet ends in a small creek. Throughout its entire extent the water is salt; some small fresh-water rivulets run into it at and above the Guardia. A boat can go from the anchorage of Anchorstock Hill to the Guardia in one tide, if the wind is not strong against her.

Excellent water.

Plenty of excellent water may be obtained from wells between Anchorstock Hill and the beach.

Fire-wood.

There is but little fire-wood. Bushes, the stems and branches of which burn well, grow upon Zuraita Island, and in hollows between the sand-hills on the North shore.

Supplies at Fuerte Argentino.

Deer, cavies, and ostriches are numerous. Fish swarm in the creeks and at the edges of the banks.

Fresh beef may be procured at the settlement called Fuerte Argentino, and but little else.

Falsa Bay is an extensive and dreary waste. Sand-banks surround it, and neither land nor landmarks can be seen until a vessel is within the banks, and then they are not wanted. The remarks on the precaution necessary on the nature of the banks, and on the passages between them, just given in the description of Bahia Blanca, apply equally to Falsa Bay, Green Bay, and to Brightman Inlet. *Falsa Bay.*

It is high-water in Falsa Bay at 5h. 30m. on the days of new and full moon. *Tides.*

Between Bahia Blanca and Falsa Bay are the Horn Spit, Lower Toro Bank, and Lobos Bank. The latter does not shoal so quickly as the others, particularly the Horn; but it stretches out to the South-east as far as 39° 21′ S. This and the other two banks should be carefully avoided, whether approaching Falsa or Bahia Blanca. A large part of Lobos Bank uncovers at half-ebb. *Horn Spit, Toro, and Lobos Banks.*

To the South and West of Falsa Bay the Laberinto Shoals extend to the South-east, from Ariadne Island as far as the parallel of 39° 27′. They are nearly all under water. Here and there a patch of sand is uncovered temporarily, and affords a resting-place for seals. *Ariadne Island. Laberinto Shoals.*

When near these Laberinto shoals you will see some rising ground upon Green Island, appearing rather high, because surrounded by a dead flat, although no more than 60 feet above the water. *Green Island.*

The Paz Bank, at the South-east extremity of the Laberinto Shoals, is the most outlying, and very dangerous. At low-tide there are not 4 feet water on it. Its seaward side shoals gradually. As the land is in sight from the vicinity of this bank, it is not difficult to avoid it during daylight. *Paz Bank.*

Laberinto Head next appears. It seems to be the termination of the shore on the South side of Brightman Inlet, and makes as a perpendicular bluff 40 feet in height. *Laberinto Head.*

From the Paz Bank the heights upon Green Island bear W.N.W. ½ W. Northerly. The nearest point of the island is distant 5 miles; the heights are distant 8 miles. Laberinto Head bears W. by S. Southerly from the same place.

The interior of Green Bay is beset with shoals, though the entrance appears somewhat tempting. If it is necessary to enter, keep close to Green Bank, taking your soundings from it, and anchor to the Northward of the narrow passage (off the East end of Green Island) with the peaked hillocks bearing W. by S. Southerly. Remember that the banks on the East side of the entrance shoal suddenly. Low-water should be chosen as the time to enter. *Green Bay.*

Off Laberinto Head, Green Island Spit extends from Green Island to latitude 39° 29′. Between this spit and the shore is the entrance to Brightman Inlet, a narrow bar-harbor. At a distance it looks like a large river. On the South side of the entrance, the land is level and rather low, ending in a bluff, 40 feet above the water. *Green Island Spit. Brightman Inlet.*

To the Northward upon Green Island are some peaked hillocks, rising 60 feet above the sea. At the Southern extremity of Green Island is a single hillock, of use as a mark. At low-water, there are 2 fathoms on the bar, which is about 2 cables' length wide.

To pass over the bar bring Laberinto Head to bear N.W. ½ W., and when the East end of Green Island bears N. by W. ½ W. you will be close to or upon it. Keep Laberinto Head bearing N.W. ½ W. until the water deepens to 3½ or 4 fathoms, with Single Hillock bearing N.N.W. ¼ W. Steer upon that line, keeping the hillock on the same bearing until Laberinto Head bears W.S.W., then steer W.N.W. ½ W. until you are almost in a line between Single Hillock and Laberinto Head, with about 4 fathoms water over a soft muddy bottom. There anchor.

The flood-tide sets across the entrance, (not right into it,) therefore a vessel should keep to the Southward sufficiently to insure a proper position. It is high-water at 5h. 10m. on the days of full and change. The tide rises 12 feet at the springs, and 8 with the neap-tides. There is only half an hour's interval between high-water in the harbor and in the offing. The strength of tide is between one and two knots. *Tides.*

A vessel approaching Brightman Inlet, with a view of anchoring, should not go to the Northward of 39° 30′. Further South will be still safer, because the coast between Brightman Inlet and the Colorado is quite free from outlying dangers, while to the Northward of that parallel the banks are extensive and dangerous.

There is abundance of game on the main and on Green Island. Good water may be obtained by digging wells, about 8 feet deep, on Green Island. Plenty of fuel may be cut on the main land. *Game. Good Fresh water.*

It appears probable that a creek, fordable at low-water, is the only separation between Green Island and the main. The tracks of cattle and horses are too numerous to suppose that there is not an easy communication. Perhaps there is no separation at all. *Fuel.*

The River Colorado is accessible to vessels which do not draw more than 7 feet. A bar surrounds and defends the entrance. This bar, and the banks inside the river, are continually changing their position. Floods, high-tides, and gales of wind cause frequent and material alterations. It is high-water on the bar at 4h. on the days of full and new moon. The tide rises from 6 to 9 feet. *Colorado River. Tides.*

The entrance to the Colorado may be known by the abrupt ending of the sand-hills. South of the river the land is quite flat and low. When East of the river's mouth, you will see the trees which grow on the banks, a short distance inshore. They are a kind of ash, and the only trees on the coast. The entrance to the river is not more than half a cable's length in breadth, and has only 3 feet water when the tide is out. It is difficult to enter, even with the flood-tide, unless the wind is fair, and not too strong. A strong South-east or Easterly wind, throws so much sea upon the bar that it is then impossible to make the attempt. The stream of the river makes the flood very weak. The ebb runs extremely strong.

The best passage is from the Northward; and when you have passed the point on the West side, keep over towards the banks on the East. All to the Westward is flat and low. A stranger would perhaps suppose the river lay more to the Westward, and would get rather hampered in consequence. This error must be guarded against by keeping over to the East side.

The river does not show itself distinctly until you are close upon the green banks, which are nearly a mile from the bar. It is about a cable's length wide, with 2 fathoms at low-water; the banks are steep to, consisting of clayey earth. From the appearance of the banks, and the large trees that are scattered about the low land, it is evident that the river is subject to vast floods; in two months only, the entrance had quite changed; what was the deepest part having become shallow, and the reverse.

No vessel, however small, should attempt to enter while there is a swell on the bar. It is also prudent to wait during one low-water at the entrance, in order to see which is the best channel. It is the only safe way. Sometimes the water is fresh outside the bar.

Cañada River. The Cañada is an arm of the Colorado, less navigable than the latter. Between the Cañada and the main-stream there are low marshy islets and winding streamlets, almost dry at low-water.

Union Bay. Union Bay is adapted to the use of vessels drawing less than 17 feet. In smooth water, with a fair wind, a line-of-battle-ship might enter, as there are not less than 5 fathoms in the fairway at high-water; but for general use, 15 or 16 feet is quite draught enough. At full and change, it is high-water at 3h. 10m. The rise of tide, from 6 to 12 feet. Vessels intending to enter Union Bay should make the land about the River Colorado, where the coast is clear, and the lead may be trusted.

Tides.

Flat-top Hill. Three-quarters of a mile North of the Colorado is a flat-topped sand-hill covered with verdure. It is 40 feet in height, the highest about that part of the coast, and may easily be recognized by a stranger. When this height bears W. by N., and is distant 4 or 5 miles, you will have from 5 to 7 fathoms water over a dark sandy bottom, and should steer S. by E. ½ E., or rather steer so as to make good that course, until you shoal your water upon the North side of the Serpent Bank, or until Creek Hill bears W. by S. Creek Hill is the highest of three hillocks 2 miles N.W. of Indian Head.

Creek Hill.

Indian Head. Indian Head is the North point of Union Bay. It appears as an island when seen from the Northward, the land Westward of it being very low. It is 45 feet high above the sea; bluff to the South-east, composed of sand hillocks, partly covered with bushes.

Serpent Bank. In approaching and entering Union Bay, the chief dangers to be guarded against are the Serpent Bank, the Dog Bank, and the tide, which sets across those banks. The Serpent, or Northern bank, extends in a long ridge, 4 or 5 miles from the shore. As far out as 2 miles from the land it dries at low-water. It shoals gradually on the North, but rather suddenly on the South side.

Dog Bank. The Dog Bank extends in a similar manner to the South-east, but it is of great extent to the Southward. The water shoals upon its edge rather quickly. The flood-tide sets to the Northward right across the banks about 2 knots, seldom more, generally less. The ebb-tide sets right out at first, and then more to the Southward as it clears the Dog Bank.

Tides.

The quality of the bottom alters as you approach the banks as it does in the other inlets and harbors of this coast. In the middle of the channels, there is soft, dark-colored sandy mud. Near and upon the banks there is hard, fine, brown sand.

Starve Island. On Starve Island there is a peaked hillock, (the middle one of three,) which may be of use when crossing the tail of the Serpent. It ought to be kept to the Westward of S.W. by W. while you are crossing, in order to insure having sufficient water. When Creek Hill bears W. by S. and Indian Head S.W. by W. ½ W., steer S.E., 5 miles, (by ground log,) then S.S.W. until Indian Head bears W. by N. With Indian Head bearing W. by N., steer for it (allowing for tide, and keeping it on the same bearing) until you are between the Serpent and the Dog Banks, and between 2 and 3 miles from the head: then steer West and anchor with Indian Head bearing N.N.W., distant half a mile. You will then have 4 fathoms at low-water over a soft muddy bottom.

Swashway.

This anchorage is preferable because of ready communication with the shore. Mud-flats extend so far from the land in all other parts that at low-water a boat cannot land. Good water may be obtained on Indian Head by digging only a few feet into the sand. *Fresh Water.*

A little to the Westward of the Head is a creek through which boats may work their way to the Colorado at half-tide. It passes close to the Creek Hills. Fire-wood is scarce about Indian Head. *Wood.*

Vessels wishing to enter the harbor of San Blas ought to make the land to the Southward of Raza Point; on no account to the Northward of it, unless absolutely certain of their latitude. Even then they should not close it to the Northward of Second Barranca Point, unless the tide is ebbing. *San Blas Harbor.*

The tides run along this coast with dangerous strength, from 3 to 5 knots. The flood is strongest by nearly a knot. As the flood sets directly towards the outlying banks you must, when near the entrance, with the flood-tide running, do one of three things: enter the channels leading to the harbor, stand to the Southward, or anchor. By standing off and on, or to the Eastward, you will be on the banks in a very short time. If you cannot stem the tide by standing to the Southward, and do not choose to enter the passage, the anchor must be dropped; and if it should come on to blow from the South-eastward, your situation will not be pleasant. With the flood-tide, weighing would be out of the question; with the ebb, you might get clear, but remember that a heavy sea tumbles in with a South-east gale. *Tides*

Raza Point is low, but on it there is a bare round sand-hill, 30 feet in height. Seen from the Southward, it appears like an island, the land to the Westward being low. *Raza Point.*

Five miles South-west of Raza Point are some sand-hills, rather more remarkable than their neighbors, being flat-topped, and partly covered by straggling bushes, which somewhat resemble a drove of cattle. *Sand Hills.*

Second Barranca Point (so called in the old charts, though called by some Piedras Point) is a sand-hilly height, roughly covered with shrubs and grass. At its base near the sea is a low cliff, the only one hereabouts, and therefore remarkable. Rubia Head and Rubia Point are in their appearance similar to Second Barranca Point, excepting the cliff at the base. *Second Barranca Point.*

Rubia Point is 40 feet, Rubia Head 35 feet above the sea. Between Raza Point and Rubia Head the coast is low, consistiug of sand-hills more or less covered with verdure. *Rubia Head.*

Five miles E.N.E. of Rubia Point is the Southern extremity of the San Blas Banks. Generally breakers are visible, though not always. Half-way between the shore and this extremity of the banks is the proper distance to keep while steering for Helgat entrance. There are three channels or passages lying close together, the Great Gat, the Little Gat, and the Ship Gat. These channels are formed by three banks and the shore. Between the shore and the nearest bank lies the Little Gat, a narrow passage, fit only for the smallest coasting craft, or for boats. *San Blas Banks.*

Between Helgat Bank and Middle Bank, is the Great Gat, the least bad of the three; and between Middle Bank and East Bank is the Ship Gat, but unfit for any vessel.

Middle Bank is a narrow ridge of shingle. Something was seen in the middle of it, which might have been a piece of wreck, but it had the appearance of a rock occasionally showing at low-water. This bank generally shows at half-tide. *Middle Bank.*

The tides run with great force, particularly in the channels; 3, 4, or even 5 knots, with very short intervals of slack water. At full and change, high-water takes place at 2h. 30m. in the offing, at 1h. 30m. under Rubia Point, and at 2h. in the harbor. It rises from 8 to 12 feet. *Tides.*

The most simple and the surest directions appear to be: wait for the last-quarter ebb, and enter as near low-water as possible. Take your soundings from the East side of Helgat Bank, and go through the Great Gat by the lead, the eye, and the plan. But to enter at any other time, more trouble will be required. When near Rubia Point, bring it to bear West, distant about 3 miles; bring Rubia Head to bear N. by W. ½ W., and the Estancia (farm-house) on the rising ground N.W. Then steer N. ½ W. until Rubia Head bears N.N.W., and the Estancia W. ¾ N., when you will be abreast of the South end of East Bank, in 4½ fathoms at low-water. From this spot N. by W. ought to take you safely through the Great Gat into the broad channel. *Great Gat.*

With the Estancia bearing W.S.W. ½ W., and Rubia Head S.W. by S., you will be in the deepest water between Helgat Bank and and the South-east end of Middle Bank. When past the Middle Bank, the Estancia will bear S.W. ¼ W. In mid-channel, between Helgat Bank and the South end of Middle Bank, when the Estancia bears W.S.W. ½ W., and Hog Island beacon is one degree open to the Eastward of Rubia Head, N. by W. ¼ W. ought to carry you safely through the deepest water.

This is the best course (N. by W. ¼ W.) with a leading commanding breeze, as long as Hog Island beacon is visible.

Beacon. If Hog Island beacon is not seen, it will be advisable to keep towards Helgat Bank until Rubia Head bears N.N.W. ½ W., and then steer N. by W. ¼ W. The lead, the breaking or rippling water upon the shoals, and the plan must assist in directing your track.

The flood-tide sets strongly towards the South-east end of the Middle Bank. The ebb sets towards the North-west extremity.

The dangerous part of this entrance is about a mile in length, after which Great Gat and Ship Gat join, making the channel comparatively wide and also deeper. While Hog Island beacon is standing, the entrance will be less difficult; but it cannot be expected to stand long in the shifting sand.

Little Gat. Little Gat is used by small fishing-vessels and by boats. Being quite close to the shore, a place of refuge is at hand if a roller should fill or capsize them. Being within three banks much sea is broken off before it reaches this passage. The eye and the lead are the only guide of those that enter by the Little Gat.

Ship Gat. Ship Gat, or Channel, has a bar across its entrance, between Middle and East Bank. It is probable that this bar and the Middle Bank, both of which are chiefly composed of loose shingle, shift occasionally. From the North-west end of Middle Bank the flood sets rather towards the North end of Helgat Bank, therefore you must be guarded in steering up N. by W. ¼ W.

When you have entered by either of the two large Gats, and have brought Rubia Head to bear W., you may steer W.N.W. to the anchorage off the watering-place.

Broad Channel. This part of the harbor is called the Broad Channel; it is about a mile wide, and the tide sets directly through. It is best to keep on board the South shore, which is steep to, and will afford some shelter from South-east winds if obliged to anchor sooner than you wish.

In working up the Broad Channel, do not stand far over to the North shore. The bank shoals very suddenly on that side. There are places where in one cast of the

Best anchorage. lead the water will change from 10 to 3 fathoms. The best anchorage is off the watering-place, within half a mile of the beach, secure from all winds, and well sheltered from the South-east. The best bower inshore in 10 or 12, the small bower to the North-east in about 14 fathoms, and open hawse to the South.

The beach is steep to, having 6 fathoms a few yards from it. The bottom is stiff sandy mud, covered with coarse gravel and shingle. Boats may land here in any weather.

Fresh water. There is a plentiful supply of good water in the wells near the beach.

Fuel scarce. Fuel is scarce in the immediate neighborhood, but can be procured in great quantity, and of excellent quality, by sending to the inhabitants, who bring it from the interior in carts. It is called Peccolini, and is the best fuel on this coast, and perhaps as good as any wood for burning. Iron may be brought by it to a welding heat.

Good fresh Provisions. Fresh provisions may be procured in abundance from the neighboring Estancia. Fish are plentiful.

With and after a gale from the South-eastward, both channels and banks are covered with heavy rollers and breakers. At such a time it would be highly improper

Tides. attempting to enter. The usual rise of the tide is between 8 and 12 feet; but it is affected here, as elsewhere on the coast, by the wind. The last part of the flood-tide comes from the Northward, from Anegada Bay, at which time the tide is beginning to ebb at the gats.

Through Anegada Bay there are numerous creek communications by which a boat may go to Union Bay and thence to the Colorado. On Deer Island there are wild dogs, the produce of those which have been left by vessels, either accidentally or on purpose. They are very savage.

San Carmen. There is frequent intercourse with San Carmen, the town on the banks of the River Negro.

Besides the injury to shipping, which is caused by the extreme dryness of this place, their chain-cables suffer from some hidden cause. Whether there is copper or anything in the bottom of the harbor which acts chemically upon the iron is hard to say, but the fact is, that in a surprisingly short time chain-cables are considerably corroded if suffered to lie upon the ground. During most summer nights no dew falls. At no period of the year is there a rainy season. During winter there are occasional but not heavy rains.

Rio Negro. In approaching the Rio Negro, it is best to keep to the Southward, and to make the land about the False Sisters, or Bermeja Head. Being certain of the latitude, and making proper allowance for the tide, may justify a direct course for the river, but on no account should a vessel incur the risk of being set to the Northward of

Tide. Raza Point. The tides set so strongly along shore, from 2 to 4 knots, that a stran-

ger, unaware of their existence, might run aground on the banks near San Blas, thinking himself to the Southward of Raza Point.

About Cape Bermeja the land is high, and the water free from danger. If set out of her reckoning during the night or thick weather, a vessel will not run any risk of getting ashore. Northward of Raza Point, the case is reversed, as the flood-tide will sweep her strongly towards the San Blas banks. Many vessels have been wrecked owing to this cause.

Tides. At the full and change of the moon, it is high-water at 2 o'clock in the offing. 3 hours later than upon the bar and at the entrance of the river. The tide runs parallel to the coast from 2 to 4 knots.

Raza Point. Raza Point may be known by observing the trend of the coast, and by some flat-topped sand-hills which are a short distance to the South-westward. It is low; upon it is a bare rounded sand-hill, 30 feet in height. Seen from the Southward it appears like an island, the land close to the Westward of it being low. Five miles South-west of Raza Point is a range of sand-hills, somewhat more remarkable than their neighbors, being very flat-topped, and covered with straggling bushes, which appear rather like a drove of cattle. *Sand-hills.*

North Barranca. Northward of the Rio Negro, the nearest land of any height is the North Barranca, so called, though in reality a range of sand-hills 140 feet high, without any cliff. From the North-eastward this ridge appears as a bluff headland, visible as soon as Raza Point is passed. All the coast Northward and Eastward of the Rio Negro is low, and generally shows sand-hills slightly covered with vegetation, or entirely barren.

Main Point. Main Point, or Redonda Point, is a low, rounded hummocky sand-hill. From the Eastward it appears to be formed by three hummocks, tolerably covered with verdure. On the highest, which is 40 feet above the sea, is a small half-formed battery and a flagstaff. The battery cannot be distinguished outside the bar. At some distance inshore two headlands will be distinguished, one of which, Leading Hill, bearing N. W. from Main Point, is the mark of most use in entering the river. It is the highest and the Easternmost of the two headlands: it has a small round-topped hillock at the South-west extremity, which slopes suddenly to the South-west. It is 130 feet high, and may be seen from 3 to 4 miles outside the bar of the river. *Leading Hill.*

Medano Point. Medano Point is very low, bare, and sandy. In very high tides it is overflowed: at such a time the entrance of the river would appear three times its usual breadth, and it would be difficult to hit the deep-water channel. *South Point.* South Point rises a little: it is a cluster of sand-hills.

Flat Point. Flat Point (within the river) is a sandy point, 25 feet high, covered with verdure. It shows a steep side to the South-west, and is rather wedge-shaped. At present this point is distinguished by a mark, the bowsprit of a large ship, erected by the Beagle's officers. This mark, if distinguishable, in one with the highest part of Leading Hill, is the best guide for crossing the bar in the deepest water.

On the beach to the Northward of the river are two wrecks; while they last they will be excellent marks. One, a brig with her lower masts standing, her hull half buried in the sand, lies rather more than 4 miles from Redonda or Main Point. The other, without masts, is a mile from Main Point, and so far inside of high-water mark, that one must suppose the land is there gaining upon the water unusually fast. They may soon decay, or be carried away for fire-wood; and yet they may be of use longer than these remarks, for heavy gales and heavier seas assist the torrent from the interior in altering and shifting the ground about the entrance of the river. In 1827, there was a battery on a part of Main Point, where in 1833 we found 2 fathoms of water.

Again, within the river, the deep-water channel has changed sides. Six years ago there were 3 fathoms where now are 6 feet. Yet the principal entrance, the South-east, and the marks (Leading Hill and the summit of Flat Point) have varied very little.

South Barrancas. From Medano Point, a low sand-hilly shore extends 2 miles to the South-west. There the land changes its character, suddenly rising into a range of perpendicular cliffs, from 150 to 200 feet in height. These cliffs are called the South Barrancas. Above them no land is seen; their upper outline is as horizontal as the surface of the sea when they are viewed from the South-east in the offing.

With Redonda or Main Point bearing N.N.W., or more Northerly, approach the bar until the water shoals to 10 fathoms. The lead lines should be carefully examined, marked to feet, and well used in both chains. The edge of the bar will always show either by breakers or by ripplings; rarely does a day occur on which there are no breakers; with any swell the breakers continue all round the bar, not excepting the channel.

Do not bring Main Point to the Westward of N.N.W. until you mean to pass the bar.

If circumstances do not admit of attempting the passage at once, you should anchor, or stand directly off shore again, because of the strong tide. Good anchoring-ground, and a convenient place for awaiting a proper time for entering, is to the Southward of the bar, with Main Point bearing North, and the North-east end of the cliffs (South Barrancas) bearing W.N.W., or from that to N.W. by W. The former bearing will give 8 fathoms, the latter 10, over a clean sandy bottom.

While the winds have Northing and Westing this is a good roadstead; but it must be quitted directly if the wind gets to the Southward or Eastward, threatening to blow strong. Very heavy seas are sent in by Southerly gales. The strength of tide should be remembered.

The proper time for crossing the bar is during the last quarter flood, before the time of high-water by calculation. The water does not rise during the last-quarter flood, and it is of material consequence that a vessel should enter the river before the ebb-tide makes out with strength. At this time (last-quarter flood) the tide is setting strongly to the North-eastward, along shore over the bar. The difficulty is to avoid being set to the North-eastward in crossing the bank. After high-water this difficulty is increased, because the powerful ebb out of the river meets the tide flowing to the North-eastward, along shore, and they together sweep over the Eastern bank at the rate of 3, 4, or 5 knots.

Rio Negro Bar.

The passage across the bar is very narrow, not more than a cable's length in breadth. At low-water there are only 6 feet upon it. Great attention to the marks, a commanding breeze, and smooth water, are absolutely necessary to enable a vessel drawing 12 or 14 feet to enter the river. Fourteen feet is almost too heavy a draught. Not that vessels of 15 or even 16 feet might not occasionally pass the bar, but to do so they must have perfectly smooth water, a spring tide, and a fine breeze of wind. The least swell might be fatal. Such smooth water is very rare on this exposed coast. Generally speaking, 11 feet is the utmost draught that may enter the River Negro without incurring risk.

By keeping Redonda or Main Point summit distinctly open to the Eastward of Leading Hill summit, so that a sail passing between them on the horizon would just fill the intermediate space; or, by keeping Flat Point in one with the summit of Leading Hill; or, by keeping the extreme of Main Point in one with the summit of Leading Hill, about N.W. ¼ N., you will cross the bar at the proper place.

When on the shoalest part of the bar the North-east end of the South Barranca will bear W.S.W. ½ W. At spring tides you will have about 18 feet, at neaps about 14.

Keep the marks in one until the end of the Barranca bears W.S.W.; then steer one point more Westerly until the Barranca end bears S.W. by W. ½ W.; then one point yet more Westerly until Main Point summit bears N.N.W. Thence steer direct for Flat Point, passing close to Main Point. Having passed Main Point, steer so as to pass close to the opposite Medano Point, and anchor in a line between Medano and Flat Points if your object is to proceed further up the river. If intending to remain at the Boca, (entrance,) a better berth is rather more to the Northward, out of the strength of the tide, in 3 fathoms (at low-water) over a muddy bottom.

In a line between Medano and Flat Points there are from 3 to 4 fathoms at low-water, with a soft, sticky, muddy bottom.

Both Main Point and Medano Point are steep to: by closing them you avoid the opposite banks, which are dangerous.

Tides.

Abreast of Main Point the channel is only 300 yards in breadth.

The tide of ebb runs through it at the rate of 2, 3, 4, 5, or 6 knots, according to the wind, the body of fresh water coming down from the interior, and the state of the offing-tide. The flood-tide is less strong, seldom exceeding 2 or 3 knots. When an unusually great body of fresh water is brought down, owing to floods in the interior country, the ebb is at the strongest; and, on the contrary, the flood-tide is hardly to be noticed, though the water rises as usual. Like all large rivers having their sources in mountainous countries, it is subject to periodical inundations.

Directly after high-water, the ebb-tide begins to set strongly out of the river, and over the N.E. bank. Care must be taken to avoid its effects by anchoring, if in sufficient water, or running out to sea again, if on the bank. There is no time to be lost; one or other alternative must be instantly adopted, if unable to obtain the proper anchorage before the tide makes out too strongly for the wind to enable you to overcome it. Very few vessels have escaped that have once grounded on the banks or bar of this river.

North-east and South-west Banks.

The North-east Bank is hard sand and shingle. The South-west is chiefly a quicksand. The sand composing it is very fine and dark-colored.

For boats there is a safer entrance than the South-east channel. They should pass the South Barrancas in 4 or 5 fathoms water, and steer about N. by E. till some bare sand-hills, rather inland, on the North-east side of the river, are distinguished.

Bringing the second of these hills (South Channel Hill) counting from the West, to bear N. by E. ¾ E., and steering upon that bearing, will carry a boat at three-quarters flood into the river. At high-water a vessel drawing 7 feet may thus cross the South bank.

This is called the West Channel, though channel there is none; but it is safer for boats to enter by this line, because they run less risk from blind breakers, which are common in the South-east channel. Also, if any accident does occur, the shore is close at hand, and the tide sets into the river.

Carmen. From the Boca to the town of Carmen, the plan and the lead will suffice. If a vessel should ground, with a flowing-tide, smooth water, and soft banks, she will not be injured; but, both for the bar and for the river, a local pilot should always be procured if possible. The banks alter more or less every year, although the main-channel is nearly stationary.

Pilots. There is a pilot resident at the Boca, maintained by the Buenos Ayrean government. When vessels approach the bar, if the weather will allow of his going out in a whale-boat, he readily embarks, and remains on board until an opportunity offers for their entering. Leaving the river is rather more difficult than entering, because of meeting instead of leaving the Southerly swell. There are instances of vessels having been detained 40 days at the Boca, waiting for an opportunity to cross the bar. No vessel should make the trial without a commanding breeze. Light winds are treacherous; they blow different ways on the river. North-east winds are the best, either for entering or leaving the river.

Tides. Some say it is high-water upon the bar at 11h. 15m.—others say 11h.—on the full and change days. It will vary much more than that quantity, even half an hour, or an hour, during gales of wind; but the usual time of high-water upon the bar, during settled weather, is 11h., or a few minutes later, on the days of new and full moon.

The tide reaches a few miles above the town of San Carmen, during the dry season. It is then high-water at the town 2 hours later than at the Boca.

Supplies. Fresh provisions, in moderate quantity, some fire-wood, plenty of vegetables, and, during the season, abundance of excellent fruit, may be procured at San Carmen.

Encouragement and protection would make this a very thriving settlement. The climate is delightful, the soil on the banks extremely rich, and watered by the periodical overflow of the river.

Port San Antonio. Port San Antonio is the best place on the coast for a large ship in want of serious repair. It may, for that reason, prove very valuable, notwithstanding its remote situation and the barren nature of the surrounding country. A ship may approach as near as may be convenient without getting into shoal-water, or running any risk, until an opportunity offers favorable for running within the Lobos Bank.

El Fuerte. In approaching Port San Antonio from the South-eastward, Direction Hill and the Fort are seen before any of the low land can be made out. If approachiug from the Southward, the hill called El Fuerte, or the Fort, is seen sooner than Direction Hill. If from the Eastward, the reverse. A more singular resemblance to a regular fortification it would be difficult to find. Some call it the Castle; but its appearance is that of one side of a regular polygon, the curtain and each bastion showing distinctly.

Direction Hill. Direction Hill is 560 feet above the sea; three small hummocks, close together, are visible on its summit.

The entrance to Port San Antonio is much exposed to South-easterly winds, and at such times it would be imprudent to approach without a probability of speedily entering, as you would be embayed, and have to contend with a heavy rolling sea.

Lobos Bank. On each side of the entrance is a bank, partly dry at low-water, and very steep at the edges. The Eastern or Lobos Bank extends 5 miles South of Villarino Point. It is very steep, shoaling suddenly from 7 to 3 fathoms.

When off the bank of shoal soundings, or in upwards of 20 fathoms water, the stream of tide is little felt, not more than, if as much, as one knot; but as you near the Lobos Bank its influence increases fast.

Good Anchorage. There is good anchorage in from 10 to 30 fathoms between the end of Lobos Bank and the Fort, as well as to the Southward and Eastward of that bank, the ground being quite clear, either fine sand or a soft, greenish, sandy mud. The shelter is good, excepting with South-east winds, which, it must be remembered, do not often blow, and still less often with violence.

Nipple Hill. For entering, keep Direction Hill bearing W.N.W. until the Fort bears S. by W., when you will see the hummock on Villarino Point bearing N. by E., and Nipple Hill showing over it on the same bearing. The Nipple Hill is the highest land hereabout, 600 feet above the sea. It is on a range of down-like heights to the Northward of the port, and carries a small hummock upon its summit resembling a nipple. Having on those bearings, steer about North, (allowing for tide,) so as to keep the

Nipple just open of the West extremity of Villarino Point, until you are half a mile from that part of the point, when you may go, by the eye, close to the bank on the East side, round the point, and go to the berth which is most convenient.

Villarino Point. Villarino point is low and sandy, with a few hummocks on it, nearly covered with verdure, and having, therefore, a dark appearance. The highest is 40 feet above the water.

Tides. At full and change, high-water is at 10h. 45m. The rise of tide depends much upon the wind, being between 3 and 5 fathoms. Between Villarino Point and the Reparo Bank the tide runs from 3 to 5 knots.

For a line-of-battle-ship two-thirds flood, but for most vessels the last quarter ebb, should be chosen as the time for rounding the tail of Lobos Bank, so as, if possible, to arrive off Villarino Point at low-water. When there all is safe and easy. The water is always smooth, and the only inconvenience is the rapid tide. A sheltered berth, suited to the object in view, may be gained by warping when the ti e suits.

Lobos Bank. It must be remembered that the fairway is not sufficiently examined, particularly along the West side of Lobos Bank. Many more soundings are required on both sides, and in the bight near the West shore: although enough have been taken to ascertain and show the nature and practicability of the passage.

A large ship intending to enter this port must take the trouble of fixing two boats or two marks upon the shoal places of 2 and 3 fathoms marked in the plan. The fairway should also be partially sounded by the person who is to pilot the ship into the harbor, to insure his acquaintance with the marks, and to guard against any shifting of the banks which may occur in so rapid a tideway.

Lieutenant Wickham remarks, "That Port San Antonio is the best harbor on this coast. It is a good port in a bad situation. Should the River Negro become of importance to commerce, vessels of much draught ought to anchor here rather than in San Blas Bay. The land-carriage from each place to the town of San Carmen is about the same, (supposing that from San Antonio you take the nearest line to the river.) Fuel is abundant. Water is deficient, but may be obtained by digging wells. Dry docks might be built for vessels of any size. There are many places where vessels may be laid ashore for a tide, without the slightest risk, the harbor being perfectly sheltered from every wind."

Escondido Creek. Tides. In Escondido Creek the keel of a line-of-battle-ship may be examined, the rise of tide being from 24 to 32 feet. The greatest rise during our stay was 25 feet, and the least 16; but from marks on the shore it was evident that 30 feet would be too small a limit to name for a spring tide, during South-east winds.

Port San Josef. The great basin of San Josef, though 26 miles in length and 11 wide, was called Port San Josef by the Spaniards; it is free from interior obstructions or danger, but the entrance has an unpleasant appearance owing to a rocky ledge crossing it, over which the water ripples so much that a stranger would hardly think it safe to enter. Eleven fathoms is the least depth that has yet been found in that channel, but the tide sets so strongly over the narrow ledge that soundings upon it are not easy. Many vessels have entered at various times, and as no one has yet encountered danger it may be supposed that none exists, excepting within half a mile of either point.

Both East and West heads are moderately high, and show distinctly from seaward. They are bold cliffs, rising abruptly to 100 or 150 feet above the water. Their color is the same as that of all this coast, where a yellowish, sun-burnt appearance continually meets the eye. Under water, from each head, the above-mentioned ledge of rocks extends across, causing, when the wind opposes the tide, a heavy rippling.

The best anchorage is in the bight to the Eastward of the Eastern head. Northerly winds send much sea into the Southern bight.

Lieut. Wickham says, "Masters of vessels who have been some months at anchor in this gulf speak very unfavorably of it. They say that a short heavy cross sea gets up with any strong wind; although the gulf is nearly landlocked. Fuel may be cut in the South-west part of the bay, from stunted shrubby trees; but near the shore there is no appearance of fresh water." To the eye, all is barrenness and desolation. How the Spaniards could have selected such a spot for a colony, is surprising.

Tides. Within the gulf it is high-water at 10h. 0m. full and change. The tide rises from 20 to 30 feet, and rushes between the heads 3, 4, or 5 knots.

Valdes Creek. Valdes Creek is a dangerously decieving inlet of a singular character. The entrance is only a third of a cable's length in breadth at most times, but sometimes it is entirely blocked up by shingle.

The tides run most rapidly through the opening, and up the long narrow passage which extends to the Northward, at the rate of 4, 5, or 6 knots. A heavy surf breaks across the entrance, when there is any swell.

The depth of water on the bar is quite an uncertainty, depending upon the length of time that has elapsed since a South-east wind has heaped up shingle at the entrance. The strong tides scour out a channel as repeatedly as the gales block it up.

It is an unfit place for any vessel unless obliged to enter from some urgent cause. Being merely in want of a port should never be a reason for attempting it. Nuevo Gulf, with every advantage, is close at hand, and always easy of access.

With the wind blowing from the South-east, no vessel, under any circumstances, should run for it; since, if the entrance is found closed, she will inevitably be lost, being then too close to get out again. The exact place of the entrance is easily known, all the land to the Northward being low, all to the Southward high and cliffy. Cantor Point, and the tides off this part of the coast, have been described in the Coasting Remarks. To avoid the races and ripplings, it is absolutely necessary to keep well to the Southward, as far at least as Ercules Point, and then run to the Northward along shore. Valdes Creek should be entered with the flood-tide and the wind off shore, by backing and filling, with the vessel's head to the Southward. There is no room to wind inside, and when bringing up, headway will be necessary to lessen the strain upon the cable. *Cantor Point.*

Nuevo Gulf is easily known by the two well-defined headlands at the entrance. Off Nuevo Head no danger exists. It is steep to, high, and bold. The highest part is 200 feet above the sea. Nifas Point is high also for this coast, being 240 feet above the water. It makes as a double point, the two corners lying N.N.W. and S.S.E. of each other. *Nuevo Gulf.*

It ought not to be approached nearer than 2½ or 3 miles, as there are rocky ledges extending from it, particularly from the N.N.W. extremity, off which there are rocks, dry at low-water, distant from the land 1½ mile. Alongside of these rocks there are 7 fathoms water; over them the tide rushes into Nuevo Gulf 5 or 6 knots, causing a heavy and dangerous rippling, the swell from which is felt entirely across the gulf, and with a Westerly wind, causes a short hollow sea.

In mid-channel you are out of the ripplings, and the tide is sufficiently strong to carry a vessel to windward, while hove to in a fresh gale. When once well inside the heads, the tide is much less strong, and the sea longer and more regular. On the South side of the gulf there are several good anchorages, off the shingle or sandy beaches, between the different heads. *Anchorages.*

There is no danger whatever in approaching them, only taking care to avoid being too near to the projecting points, as they have, like the rest of the projections on the coast, rocky, foul ground, extending to seaward some part of a mile.

The cliffs here are like those further Northward, consisting of sandy clay, or rather diluvial earth, containing prodigious quantities of fossil shells.

The best anchorage in the gulf is in the South-west corner, lying between the first two white cliffy points. These points are between 40 and 50 feet in height. *Best anchorage.*

With the Eastern cliff bearing E.N.E., and distant about a mile, you will find a good anchorage, with 5 fathoms at low-water, over a muddy bottom. Westward of this anchorage there are many places where an anchor may be dropped with propriety, the bottom being sandy mud, or clay.

The Northern part of the gulf is lined with steep cliffs. There is a remarkable rock called the Pyramid at the North-east part. *Pyramid.*

Pyramid Road, near the Pyramid, is sheltered, and good anchorage, except with Southerly winds. No tide is felt here. The best berth is with the Pyramid bearing West, or W. by S. Ten miles within the heads of the gulf the tide is scarcely felt. *Pyramid. Road.*

On full and change days of the moon it is high-water at 7h. 0m., and the average rise is 10 feet. *Tides.*

There is plenty of small wood for fuel in the South-west part of the bay, and there are some ponds of excellent water upon a clayey soil, which appear to last all the year round. Good water may also be procured in abundance by digging wells. *Fuel. Fresh water.*

The entrance to the River Chupat is at the South-west corner of the bay of Engaño, just where the beach ends, and the rising ground begins. A reef of rocks, dry at low-water, extends across the mouth, and apparently shuts it up. At half-tide the rocks uncover. *Chupat River.*

The bar between the reef and the beach has scarcely a foot of water on it when the tide is out. At high-water there are from 7 to 12 feet, according to the state of the tide. The greatest rise of tide during the neaps was found to be 6½ feet. *Chupat Bar. Tides.*

To enter, the channel must be examined at low-water, and a buoy placed at the end of the reef, because the deepest water is close to it. Within the reef the water is at all times quite smooth. Near the mouth the river is not more than 60 yards wide, and is 5 feet deep at dead low-water. Higher up it gets broader, but not deeper.

At low-tide the water is quite fresh at the bar, and at high-water 3 miles only above it.

Boats, or flat-bottomed barges, might be tracked up by men or horses to a great distance. The river is free from obstacles, and the banks are firm and level. The ebb runs 2, 3, or 4 knots; the flood is not felt more than 6 miles from the entrance.

The best time to leave the river is before high-water with the last-quarter flood, because when the ebb makes it sets directly upon the reef. At each side of the mouth are great quantities of drift-wood. Many fragments of light volcanic scoriæ were picked up, possibly washed from the volcanic mountains on the Western side of the continent.

Sauci-trees (a kind of willow) grow on the banks of the river in great abundance; they are chiefly the red sauci, which is more durable than the white. It is fit for pumps, pump-boxes, boats, and many other purposes for which elm is frequently used. The very winding course of this river, and the rich soil through which it flows, affords facilities for isolating numerous peninsulas, and artificially watering a very large extent of country. No defence is so certain against the Indians as a ditch filled with water, no matter how small. They never willingly cross water in their attacks.

Had Sir John Narborough seen this part of the country, he would not have given so unpromising a report to his master. How the Spaniards could have overlooked it, having a settlement so near, upon the peninsula of San Josef, is surprising. Perhaps the Indians were numerous, and kept them within bounds.

Port Santa Elena. Anchorage. Santa Elena harbor may be easily known by some hummocky hills on the North-east projecting point, on the Easternmost of which there is a remarkable stone resembling a monumental record, but it 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-fathoms bank must be avoided, for which the low island is a good mark.

Tides. It is high-water, at full and change, at 4 o'clock, and the tide rises at springs 17 feet.

Bad water. Fuel. Refreshments. The water that is contained in the wells 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 which is described in the account of Port Desire, and which is tolerably abundant here. Guanacoes, ostriches, armadilloes, and the cavia or Patagonian 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 a difficult animal to approach.

Reef off Cape Raso. Salaberria Reef. In approaching Port Santa 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 called the Salaberria Reef, situated 4½ miles E. by S. from Cape Raso, and N. E. ½ 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 3½ miles from the point, besides several patches which break. The tide sets rather strongly along the shore, which is fronted by 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.

Cruz Bay. Should the above reef be as continuous as it appears, there ought to be good riding in the bay between Cape Raso and Port Santa Elena.

Cape Dos Bahias. Between the South head of Port Santa Elena and Cape Dos Bahias are two bights in the coast, the Southernmost of which is considerable, and may probably afford a good anchorage. Cape Dos Bahias is a rounded point, with a hill close to the sea on the most projecting part of the cape, and the small islet of Arce to the S.E. of it.

Leones Isle. Between Leones Isle (sometimes called Ship Island) and Harbor Isle is an anchorage, good in point of safety, but somewhat disagreeable on account of the eddy tides. The eye is a sufficient guide in entering, as the shore is bold, and there is no hidden danger. There is generally a small stream of fresh water at the North-west part of Leones Isle, but it cannot be depended upon during the summer months. A few bushes may serve for a temporary supply of fuel, but there are not enough for a store. There is no passage between the two islands except for boats. The ground towards the narrow part of the passage is rocky and uneven. The tide sets directly through, causing eddies which will turn a ship round at her moorings against a strong breeze.

Harbor Islet. In the best anchorage abreast of the middle of Harbor Islet there are 4 fathoms at low-water, over a clean sandy bottom.

In approaching this anchorage, the set of the tide should be considered, in order to determine whether to pass round the North or round the South side of the island. The flood-tide runs strongly to the Eastward round the Northern side, between it and the main-land.

Egg Harbor. Egg Harbor, formerly called Port San Antonio, is one of the best ports on the coast. In entering, a vessel may pass on either side of Valdes Isle, and steer by the eye. There is no hidden danger. Southerly winds send in a good deal of swell, but

cause no further inconvenience. The best anchorage is in the North-west corner, shutting the point of the main-land in with Valdes Isle. In this spot are 5 fathoms water, over a stiff clayey bottom. The lead may show shingle or gravel, but there is stiff clay underneath.

Port Desire. Port Desire has rather a difficult entrance, from the strength of the tide and its narrow breadth, and it is rendered still more confined from several rocky reefs that extend off the North shore, or that lie nearly in 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 dropped in with the tide, should the wind be, as it generally is, Westerly. If it be fair, it will be 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 on that coast always grows upon, and therefore planly indicates the existence of, rocky ground. The course in is about W.S.W., and the distance from the entrance to the anchorage is 1½ mile. *Anchorage.* The anchorage is off the ruins on the North shore, and the vessel should be moored; the tide sets in and out regularly.

Refreshments. Four miles above the ruins there is a small peninsula, connected by a narrow 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 feeding-place. These animals are abundant, but unless stratagem be used, they are very difficult, from their shyness, to be approached. *Water.* There are some water-holes near the ruins, which generally contain water, but of so brackish a quality as scarcely to be worth notice. *Wood.* The wood is the same kind that was described in the account of Santa Elena, and it burns well; but on the islets further up the inlet, and in many of the valleys, fire-wood of a superior quality may be freely obtained.

Captain Fitzroy adds to the above account of Captain King's, that vessels of 300 tons will not find very easy access to Port Desire, the narrow and hooked entrance, the strong tides, the short interval of slack water, and the uncertain bottom, are sufficient obstacles to deter any large ship from making the experiment, unless urged by necessity. In the Beagle's last visit she knocked off a piece of her forefoot against the rock, to which she has given her name, and which lies N. ½ E., 3 cables' length, from Chaffers Point. Entering by a compass course is out of the question; for two leads, a sharp eye, the braces in hand, and moderate sail are precautions absolutely necessary, as the tide hustles a vessel through in a few minutes, even against a strong wind. With Westerly winds, good anchorage may be obtained outside the port.

Natives. Once or twice in the year, a large body of Indians visit this place as if to reconnoitre, and therefore no straggling parties from the ship, much less individuals, should venture to any distance without having ascertained that these sanguinary intruders are not in the neighborhood. "War to the knife" with all white men is now their maxim, in consequence of the treatment they have received from the Spaniards and their descendants.

Tides. At the entrance of Port Desire, it is high-water, at full and change, 10 minutes after 12 o'clock, and the springs rise 18 feet.

Sea-bear Bay. Sea-bear Bay is a good anchorage, but from the strength of the tides troublesome to enter.

The bottom, besides, is very foul, and 30 fathoms deep; and though an anchor might save a vessel from driving ashore, she would not be likely to regain it. In entering the bay, border pretty close to the Wells Point, the low rocky point to the Southward, in order to avoid May Reef, which lies about a quarter of a mile N. ½ E. from it; but as the sea always breaks upon it, the eye and a due consideration of the tides are the best guides. This reef extends for some distance to the Eastward of the breakers, and therefore the tide, when within it, sets in or out of the bay, but with little strength. Should a ship not be able to enter the bay, there is anchorage off Wells 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 casts of the lead 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, Wells Point bearing E. by N., *Anchorage.* in 4 fathoms at low-water, but avoiding the kelp which projects off from the sandy beaches: this is, however, sufficiently distinct. A small vessel may easily turn in, but I should hesitate in taking such a step unless I was certain of her qualities. When once in, the anchorage is good, and protected at all points, except between N. E. and E. by N.; but from the appearance of the beaches it is not probable that a heavy sea is often thrown in. There is no wood to be procured of any size, and the *Wood and water.* few gallons of water that may be collected in the wells at the point are too precarious to be worth attention. The passage to those watering-holes is over a small rocky

bar, which a boat may cross at three-quarters flood; they lie immediately within the Wells Point: 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 of the wells at the point we found to be full of sea-water, which had breached over the rocks; the other contained about 40 gallons, which were rather brackish. In short, besides a secure anchorage, this place affords no other advantage, though convenient for sealing-vessels to anchor in while employed in their occupation upon Penguin Island.

Tides. Wells Point is in lat. 47° 57′ 20″ S., and long. 65° 44′ 40″ W.; variation 20° E.; high-water, at full and change, 12h. 45m., and the tide rises 20 feet.

Port San Julian. Mount Wood is visible from the deck for at least 11 leagues, and is a good mark for Port San Julian, being flat-topped, and much more elevated than the land about it: the trend of the coast may also be a good mark; and as the land about the port is higher than to the Southward or Northward, no mistake can be made. 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 Mount Wood W.S.W. ½ W. will lead you to the South head, which will be easily distinguished when at the distance of 6 or 7 miles, or more, according to the state of the weather.

Having made out the two points which form the entrance, Curioso and Desengaño, steer for the latter, and if the tide does not serve for going in, anchor in 8 or 9 fathoms about a mile N.E. of that point, till a proper opportunity offers; but if the wind be S.E., or the weather threatening, stand off and on. An extensive bar crosses the entrance, and in the middle dries at low-water, leaving a channel on either side, with something less than 2 fathoms in them, and rather intricate. But the great rise of tide (30 feet at the highest springs, and 16 in the dead neaps) makes the passing this bar comparatively easy. Great attention should be paid to the set of the tides, which run in and out sometimes at the rate of 4 knots. Half-flood is the best time for entering, as a vessel will then have depth enough on the bar, and the parts that dry at low-water will still be visible. The most convenient anchorage is off Sholl Point, in 4 fathoms.

No fresh water was found in any part of the inlet, its upper division being a chain of salinas; but wood may be procured with ease on Shag Island, and at other places. Abundance of sea-fowl may be killed, and fish of various kinds are plentiful.

Tides. The little monument erected by his shipmates to the memory of Lieutenant Sholl, close to the point, stands in 49° 15′ 20″ S., and 67° 42′ W. It is high-water, at full and change, at 10h. 45m., and rises at high springs 30 feet.

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 conspicuous manner in which it makes either to the Northward or the South-eastward. From the latter direction, a coast-line of cliffs and downs of considerable height is seen extending from the Southward as far as the eye can reach, and terminating abruptly in the high, steep, flat-topped cliff, Mount Entrance, of which the upper part descends vertically; the lower slopes off, and appears to be united with some low land, which will be seen (according to the distance off) two or three points of the compass to the right of it. Mount Entrance stands on the South side of the river, and is, by angular measurement, 356 feet high; the low land is on the Northern side, and outside of the river.

The outer part of the bar, on which at low spring-tide there are 14 feet, lies 4 miles outside of Mount Entrance. There are several shoal patches on it which dry, or at least break, at low-water. Weddel Bluff kept open to the North of Entrance Point, and seen over Sea-lion Island, on the bearing of N.W. by W. ¾ W., seems to offer the most direct route across the bar. This mark, however, does not agree with that given by Captain King and Lieutenant Weddel; and Captain Fitz-Roy judiciously remarks, that where the tides are rapid and a heavy sea frequent, it is not probable that a bar of sand and shingle stretching across the mouth of a large river should long retain its position. Strangers are therefore advised to remain outside the bar, either at anchor or under sail, till low-water, when its shallow parts will show themselves; and then, as the tide rises very high, to weigh at half or two-thirds flood, and steer directly in through the most convenient of the channels, of which there were three open in 1834.

Twelve miles up the river, on the South bank, is Weddel Bluff, a conspicuous headland; and 6 miles further is another, called Beagle Bluff. Weddel Bluff, kept open of the South entrance point, and in a line with the centre of Sea-lion Island, bearing N.W. by W. ¾ W., is the leading-mark for the passage over the bar; and the Beagle Bluff a little open of the low points on 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 impediment 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 on the South side of Sea-lion Island, where the water is shoaler, and the tide not so strong.

If the object of entering this harbor be wood or water, or to refit, a good berth will be found above Sea-lion Island, and near the shore under Weddel Bluff; but strangers should first anchor in the bight near Keel Point, so that another ebb may expose to view the shoals that surround that island. If it be intended to sight the vessel's bottom, the sloping shingle beach at Keel Point offers a most convenient spot; and the prodigious rise of tide, and clean shore, renders Santa Cruz a most desirable place for that operation. The anchorage off Keel Point is easily taken or quitted, but in moving, all vessels should have their anchors ready, and a boat ahead, for the tides are sometimes furiously strong, from 3 to 6 knots, and the banks are somewhat changeable. In bringing up, they should use heavy anchors, and veer plenty of cable; they should avoid dropping them in the strength of the stream; and if near high-water, they should carefully consider the probable fall of the tide.

Fire-wood may be cut near the anchorage, but water can only be obtained by sending the boats up the river; during the last half of the ebb the river water is generally fresh above Weddel Bluff.

The position of Keel Point is 50° 6′ 45″ S., and 68° 23′ 30″ W. It is high-water, at full and change, 9h. 30m.; spring tides rise 40 feet, the neaps 18, and they run from 6 to 3 knots. In the offing they turn 2 hours later than in the harbor, and the flood runs to the Northward. *Tides.*

OF THE WINDS AND WEATHER, TIDES, AND VARIATION OF THE COMPASS, BETWEEN CAPE BLANCO AND CAPE VIRGINS.

Our knowledge of the wind and weather upon this part of the coast is 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 9 and 10 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 inshore, which is probably owing to the eddy-tide setting out of St. George's Gulf. *Tides.*

The variation of the compass gradually increases from the Rio de la Plata, where it is about 14°; in lat. 36½°, long. 55¼°, it is about 14½°; in lat. 41°, and long. 60°, it is 16°: in lat. 41½°, and long. 60¾, 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 22½°.

Cape Virgins.

CAPE VIRGINS.—In approaching the strait of Magellan from the Eastward, the first land usually seen, and the best to make, is Cape Virgins; it is the South-eastern point of a range of steep white cliffs, about 200 feet in height; the cape itself is 160 feet high.

Dungeness Point.

Extending nearly 4 miles to the Southward is Dungeness Point, a low flat, formed entirely of shingle. On the opposite coast lies Cape Espiritu Santo, very similar to Cape Virgins; and Catharine Point, very like Dungeness. Cape Espiritu Santo is the North-west end of a high range of white cliffs. Beyond it, to the Westward, there is only one low short range of cliffs, less than half the height of Espiritu Santo. The upper outline of this cape slopes away on both sides like the roof of a house.

Cape Espiritu Santo.

Catharine Point.

Between these remarkable headlands, or rather between the two shingle points, lies the entrance to the strait.

In the vicinity of Cape Virgins and Espiritu Santo, it is high-water between 8h. and 9h. in the morning, on the days of new and full moon; while the stream of flood is still running to the Westward into the strait, and to the Northward past Cape Virgins.

Tides.

Spring tides rise from 36 to 40 feet vertically; neap tides, about 30 feet.

Sarmiento Bank.

Off Cape Virgins lies the Sarmiento Bank: this shoal has been too little considered by those who have hitherto passed that cape. After half-flood, or before half-ebb, a ship may pass Cape Virgins at any distance not less than a mile, and may cross the Sarmiento Bank without hesitation; but when the tide is low, 10 miles is not too far for a ship to keep from the Cape, until it bears N.W. by W. A ship might often pass over this bank without touching, even at low-water, because the bottom is uneven; but there are places which no vessel drawing more than 12 feet could pass at a low spring-tide without injury. This bank extends about 20 miles E.S.E. from Cape Virgins, and appears to average a mile in breath. The soundings on it are shoal and very irregular, at a less distance from the cape than 10 miles; but beyond 10 miles distance, as they increase, they become more regular.

Virgins Reef.

A reef, which at half-tide is scarcely observable, projects full a mile from Cape Virgins; this and Sarmiento Bank are the only dangers on the North side of the approach.

Soundings.

In standing Eastward from Cape Virgins, the bottom is very fine brown sand, without shells or stones. When, by standing more Southerly, the water shoals upon the Sarmiento Bank, the sand becomes much coarser, and is mixed with slate pebbles, or broken stones of all sizes: the sand is slaty.

This rule continues till the water deepens to 30 fathoms, or more, to the Southward, when shingle only is found; and when it begins to shoal in approaching Tierra del Fuego, there is coarse dark sand, mixed with stones of various sorts, chiefly slaty. Between the shoal parts of the bank and the deep water, or from 16 to 30 fathoms, the sand is coarse, particularly near the deep water. In standing to the Southward, after bringing the cape to bear West, the bottom is a very fine gray sand, until near the ridge or bank, with Cape Virgins bearing W.N.W.; with the cape in this bearing, the sand is coarser, and mixed with large and small shingle.

In crossing the Sarmiento Bank, when standing to the Southward, the fine dark grayish-brown sand changes to coarse slaty sand, with small stones and shingle; the stones chiefly slaty. Some casts after crossing the ridge were found to be entirely of coarse sand, while others were all shingle. As the water shoals, the bottom is coarser and more mixed.

When to the Northward or Eastward of the Sarmiento Bank, the lead brings up fine brown-gray sand, while near the latitude of Cape Virgins; but when N.N.E. of the cape, the sand is like steel-filings.

OUTER OR SEA-COAST OF TIERRA DEL FUEGO.

Catharine Point.

Catharine Point is the North-eastern extremity of Tierra del Fuego; it is formed of shingle, very low, and precisely similar to Dungeness upon the opposite coast of Patagonia. Between Catharine Point and Cape Orange there is a large bay, called by Sarmiento, Lomas Bay. The land around it is very low, and the space which appears to be water is chiefly occupied by extensive shoals: some of them are visible at low-water.

Cape Espiritu Santo.

Ten miles inshore there is a range of land from 200 to 600 feet in height, and extending from Cape Espiritu Santo to the Westward. From Catherine Point to Cape Espiritu Santo the shore is low. Lying 2 miles Northward of that cape, there is a reef with shoal water. Cape Espiritu Santo is a steep white cliff, 190 feet high, somewhat resembling the gable-end of a large but low barn. This cliff is the termination of a range of rather high land, lying nearly East and West, corresponding in

height and position to the opposite range, which is terminated by Cape Virgins, but not so horizontal in outline.

The Fuegian shore has many hummocks, and does not show any extent of table-land similar to the Patagonian ranges. From Cape Espiritu Santo cliffs from 100 to 300 feet in height, extend, with but few breaks, to Nombre Head: the land is 300 or 400 feet high, irregularly rounded in outline, quite destitute of wood, and, excepting being rather greener, resembling the coast of Patagonia. *Nombre Head.*

South-eastward from Nombre Head extends a low shingle beach, forming a spit, behind which is the large bay of San Sebastian: an excellent anchorage as respects shelter, good bottom, and easiness of access, but without wood, or a good watering-place, though water may be procured.

Coasting along this shingle spit, the depth is not more than 10 fathoms, but it deepens suddenly near the South-east extremity. Within the shingle point, which is steep to, or nearly so, the bottom is uniform, but the depth gradually decreases.

Between Nombre Head and a range of higher and more hilly land which is terminated by Cape San Sebastian, the land is so low as not to be visible from a ship's deck until within the horizon: hence the old supposition that a channel existed in this place. The shingle beach, or, rather, the long ridge of shingle which extends 9 miles Southward from Nombre Head, ends in a narrow steep point, which may be closely approached.

Westward of this point, called Arenas, and between it and Cape San Sebastian, there is a spacious harbor, secure from all but Easterly winds, which seldom blow, and never with any strength. There is no hidden danger on the North side of the bay, the shingle is steep to, the shores of the bay shoal gradually, the bottom is clean, and the soundings are regular. On the South side, off Cape San Sebastian, it is otherwise: a shoal rocky ledge extends under water to the North-eastward, and requires a berth of 3 miles; there is no kelp upon it. On its edge you shoal suddenly from 12 to 4 fathoms: the ebb-tide sets rather strongly over it, about 2 knots; the bottom is hard, and offers bad holding. *Arenas Point. San Sebastian Bay.*

Cape San Sebastian is a bold cliffy headland, of a dark color; inshore of it the land rises to near 1000 feet above the sea, and becomes more irregularly hilly. From Cape San Sebastian a short range of cliff extends; then low land; and then another small cliff, off which there is a rock above water about a mile off shore. *Cape San Sebastian.*

Hence to Cape Sunday the shore is rather low, irregularly hilly, and fronted by a shingle beach. Cape Sunday is a prominent headland, of a reddish color, rising 250 feet above the sea: the shores near it are free from danger until near Cape Penas, near which are some dangerous rocks. *Cape Sunday.*

Cape Penas is not more than 100 feet above the sea; around it, to a distance of 2 miles, there are dangerous rocks: the sea generally, if not always, breaks upon them; but they should be carefully avoided, especially at night. *Cape Penas.*

The bay lying to the Southward of Cape Penas appears to afford anchorage; but the appearance is deceitful, as it is shallow and strewed with rocks. The hills hereabout are higher and partially wooded, and the view of the country is pleasing.

Capes Santa Inez, Medio, and San Pablo are high and bold; they are fronted by steep cliffs, 200 or 300 feet in height. Hence to Cape San Diego there is no outlying danger; the water is rather deep near the shore, but not so steep as to prevent a ship anchoring during Westerly or Southerly winds. *Capes Santa Inez, &c.*

The Table of Orosco is a remarkable table-topped hill, about 1000 feet above the sea. Between it and Cape San Diego there are three remarkable hills, called the Three Brothers, and the Westernmost of these hills is very like the Table of Orosco: they are from 1000 to 1400 feet in height. *Table of Orosco.*

Policarpo Cove is a deceiving place; it looks like a harbor, but is fit only for a boat. False Cove will hardly give a boat shelter. Cape San Vincente is a dark-looking low bluff point, backed by woody hills, 200 or 300 feet in height. Some rocks and foul ground extend half a mile from the point of the cape. *Policarpo and False Coves.*

Between Cape San Vincente and Cape San Diego lies Thetis Bay, an anchorage which might be taken by a vessel intending to go through the Strait of Le Maire, but detained by wind or tide; the bottom is mixed rocky, in some places, in others sandy, with mud and stones; and the tide sets strongly from 1 to 3 knots across the bay, in a line between the heads. There is much kelp in the bay, but no dangers could be discovered amongst it. When the wind opposes or crosses the tide, a great sea rolls into this bay, which can only be recommended as an anchorage fit for remaining at during a few hours. In leaving it to pass Cape San Diego, a considerable offing must be obtained in order to pass round the very heavy tide-race which extends from the cape to a distance of 3 miles into Le Maire Strait, and on no account, through it. *Cape San Vincente. Thetis Bay.*

Cape San Diego is low, with a smooth outline ending in a small bluff. The rocky ledge, extending to the Eastward from this cape, is more dangerous than has been supposed. So violent was the race of tide upon it, as to prevent soundings being *Cape San Diego. Race.*

taken so frequently and accurately as was desirable; in the middle of the race, they were found to vary suddenly from 60 and 70 to 5 and 9 fathoms; it will be, therefore but prudent to give this cape a berth of at least 3 miles. This race is at times very dangerous; a vessel was seen to founder in it, but whether from striking on a rock, or from being swamped, was not known.

Along this North-east coast of Tierra del Fuego the soundings are regular, and the bottom in most places clean and fit for anchorage. During Westerly and Southerly winds a vessel may lie at anchor under the lee of the land very conveniently; but a Northerly or Easterly wind sends a heavy swell upon the shore. Near the Straits of Magellan, as well as Cape San Diego, the tide is much felt, but there is very little along the intermediate coast.

Tide. From Cape San Diego to the Northward the flood-tide sets North and West along the shore from 1 to 3 knots. The ebb sets in a contrary direction, but not so strongly.

Good Success Bay. Seven miles South of Cape San Diego is the bay of Good Success. 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 1200 feet above the sea, surround the bay; therefore with strong winds it is subject to squalls, which during Westerly gales are very violent. It 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.

Squalls.

Cook's Broad Road. 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 outside the harbor.

Cape Good Success. Cape Good Success is high and bluff; some rocks lie close to it above water.

Strait of Le Maire. The soundings in the Strait of 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.

Tides. 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 rise of tide is from 6 to 8 feet, according to the wind.

In the Strait of Le Maire the flood runs from 2 to 4 knots near Cape San Diego, and from 1 to 3 in mid-channel, more or less, according to the strength and direction of the wind.

Tides. The tides in the strait 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.

Valentyn Bay, &c. Neither Valentyn Bay, Aguirre Bay, nor Spaniard Harbor, is fit for more than temporary anchorage during Northerly or Westerly winds, all being much exposed to the South.

Bell Mountain. The Bell Mountain is remarkable: it is seen far at sea, from the Northward as well as from the Southward; it is high, and in shape resembles a large bell.

Lennox Island. 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 Westward of Cape Horn, neither is the land near so high.

At the East side of Lennox Island there is excellent anchorage; small vessels may go into a cove, 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 3000 and 4000 feet above the sea. This channel averages 1¼ mile in breadth, and in general has deep water; but there are in it many islets, and rocks near them.

Beagle Channel.

Mount Sarmiento. A range of high mountains continues uninterruptedly from the Strait of Le Maire to the Barbara Channel. Mount Sarmiento, 6800 feet above the sea, is in this range. Southward of these mountains is a long extent of broken land, intersected by passages or large sounds. A boat can go from the Eastern entrance of the Beagle Channel to the Week Islands, 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. *New Island.*

Good temporary anchorage during Westerly winds may be obtained under New Island, or near the shore to the Northward; but there appears to be no good harbor, between Richmond Road and Good Success Bay, in the Strait of Le Maire.

Regular soundings are found hereabouts, in all directions, and the shore is steep to.

Goree Road, on the West side of Lennox Island, is an excellent place for ships; very easily entered or quitted, and able to furnish wood and water with as little trouble as any harbor on the coast. It should be particularly remarked here that the kelp in Goree Road, as well as that which extends out from Guanaco Point, partly across the entrance to the road, does not, as far as we have been able to discover, grow upon rock, but upon loose detached stones, and need not, therefore, be a subject of so much alarm. *Goree Road.*

Nassau Bay extends to the North and North-west, into the Beagle Channel, through Ponsonby Sound. It 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 daylight. The Northern shore is low, particularly towards Guanaco Point, where the coast changes its level land, and low earthy cliffs, for rocky heights. In Nassau Bay the compasses are much affected; they become very sluggish, and might cause a serious error if not carefully attended to. *Nassau Bay.* *Compasses affected.*

The Northern shores of the Hermite Islands afford anchorages, and are free from outlying or hidden dangers.

Middle Cove, though small, is secure, but when it blows, the squalls from the high land around are furious. *Middle Cove.*

North Road is easy of access, quite sufficiently sheltered, and a very good stopping-place for a vessel working through Nassau Bay.

Franklin Sound is clear of obstruction, and has no other dangers than those which are shown in the chart. *Franklin Sound.*

Port Maxwell is a perfectly secure anchorage, and untroubled by mountain squalls, (or willywaws,) 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. *Port Maxwell.*

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, but they are too close to be of much consideration. *Chanticleer Island.*

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, according to the wind and tide; and in the bay, changes its direction with the change of tide. *St. Francis Bay.*

Cape Horn is the Southernmost point of the Hermite Islands. There is nothing very striking in the appearance of this promontory, as seen from a distance; but, in passing near, it is more remarkahle, showing high black cliffs towards the South; it is about 500 feet above the sea. *Cape Horn.*

One mile to the Westward of the cape there are three rocks, generally above water; the sea always breaks on them. *Rocks.*

Off the East point of Horn Island, there are some small rocks and breakers; and off Cape Deceit several rocks, but all above water; and 2 miles to the South-east of the cape, there is a cluster, rising 30 or 40 feet above the sea. *Cape Deceit.*

West Cape, on Hermite Island, is low. The land about St. Martin Cove is high and rugged. Wollaston and Herschel Islands have also ridges of mountains. Kater Peak, the highest land (excepting Mount Hyde) on the islands, is 1740 feet above the sea. *West Cape.* *Kater Peak.*

No dangers exist to the Southward, in approaching these islands; they may be closed without hesitation.

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 2 knots, at others it is hardly worth notice. It has never been found to set to the Westward at any time of tide, or with any wind. *Currents.*

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 2 knots, 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.

The Barnevelt Islands lie 11 miles N.E. by E. from Cape Deceit. *Barnevelt Isles.*

The Eastern side of Hardy Peninsula affords several anchorages.

Pack-saddle Bay, sheltered from N.W. winds by a curious island resembling a castle or pack-saddle, is safe and roomy, but not so convenient as Orange Bay. *Pack-saddle Bay.*

Orange Bay. Orange Bay is considered the best anchorage on the coast; it is somewhat open to the East winds, but they seldom blow strong. No sea can be thrown in, because of the Hermite Islands.

Anchorage. Off Orange Bay anchor-soundings extend to 2 miles from the land. The opening of the bay is 3 miles wide, and in that part are 18 or 20 fathoms, over fine speckled sand. Two islands, the largest 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, on a bottom of fine speckled sand, and the depth of the water varying gradually from 5 to 20 fathoms. The land hereabouts is low, comparatively speaking, and you are not annoyed by the violent squalls which come from the heights in other places.

Wood and water. 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.

Tides. It is high-water at 3h. 30m.; rise of tide 6 feet. There is no current worthy of notice.

Schapenham Bay. Schapenham Bay is 1½ mile 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 its 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 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 very 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.

Lort Bay. Five miles S.S.W. of Schapenham Bay, is the Bay of Lort; about 2 miles wide. A vessel may anchor there, if necessary, in 8 or 10 fathoms, sand; but some rocks above water lie off its Northern shore.

False Cape Horn. False Cape Horn, the Southern extremity of Hardy Peninsula, is a very remarkable headland, and from the East or West resembles a large horn.

Nassau Bay. If bound to the Westward of Cape Horn, it might be preferable to work through Nassau Bay, and stand out from False Cape Horn, instead of making Westing in the open sea, as is usually done. There are no dangers but those which are shown in the chart, the water is comparatively smooth, and an anchorage may be taken at night; for this purpose Goree Road, North Road, or Orange Bay may be chosen.

When it blows too hard to make any way to windward, it is at least some satisfaction, by lying quiet, to save wear and tear, and to maintain one's position, instead of being drifted to leeward, and perhaps damaged by the sea in the offing. There is less current through the bay than in the offing near Cape Horn.

Diego Ramirez Islands. The Diego Ramirez Islands lie nearly North and South, and extend over a space of 5 miles. The highest part of these islands is about 150 feet above the sea. There is no hidden danger near them. 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 N.E. corner, in which boats may land, and where water may be procured on the point close to the Eastward of the landing-place.

Water.

Between the Hermite and Diego Ramirez islands, there is no danger of any kind.

New Year Sound. In proceeding Westward New Year Sound next presents itself. It is a large tract of water studded with islands, and extending to the North-west.

Henderson Island. On Henderson Island, at the entrance of the Sound, there is a high sharp-pointed hill, visible at a great distance. From its summit the Diego Ramirez Islands may be seen, though 50 miles distant.

Indian Cove. Indian Cove, about 12 miles from the entrance of the sound, and on the Western shore, is not a place to be recommended; vessels must go far among the islands to reach it, and when there, they will find a bad rocky bottom, with deep water.

Between False Cape Horn and Cape Weddell, at the Eastern side of New Year Sound, there is a tract of broken land, which has not been properly examined. It is, however, a lee shore during S.W. and Southerly winds, and therefore unfit for anchorage.

There may be good anchorage between Morton and Henderson Islands. There was no time to examine some coves on the Eastern side of Morton Island, but their appearance seemed to promise shelter and holding-ground. *Morton Island.*

Clearbottom Bay is at the North end of Morton Island, and a good anchorage; it is an anchorage which, by being close to the coast, is convenient for a vessel to touch at for wood and water. To sail into it from sea, bring the Eastern Ildefonso Island S. ½ E., and steer N. ½ W. for Turn Point; about 1½ mile E.N.E. of this point is the anchorage, and at the distance of 3 cables' length from the shore, in 22 fathoms on a bottom of sand and clay, is the most eligible berth. *Clearbottom Bay.*

Leading Hill on Hind Island, is a very remarkable double-peaked height, and may be seen from a distance of 6 or 7 leagues. It points out the entrance of Duff Bay. *Hind Island.*

The Ildefonsos, a large group of rocks and islets, 5 leagues to the Southward of Morton Island, next claim attention. They extend 5 miles in a N.W. and S.E. direction, are very narrow, and about 100 feet above the sea. They appear to be the remains of a mountain ridge, broken through in many places by the sea. Vessels may pass close by them, for there is no danger. Sealers have much frequented them for fur seals. *Ildefonso Islands.*

Neither Rous Sound nor Trefusis Bay afford anchorage.

The Wood Islands afford no good anchorage. Passages and broken land lie behind them to the Northward. *Wood Islands.*

Captain 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. There is no hidden danger. Adventure Cove, in which he anchored, is the easiest of access, but it will only hold one vessel. *Christmas Sound.* *Adventure Cove.*

March Harbor is large, with good holding-ground, but there are many rocky places; and on a sunken rock marked by very thick kelp, there is only one fathom. No vessel of more than five hundred tons should attempt to enter Christmas Sound. *March Harbor.*

Port Clerke is a bad place for any vessel, though quite secure when inside; access is difficult, and from its situation, it is exposed to very violent squalls. *Port Clerke.*

Waterman Island is known by its remarkable heights, the Southernmost of which was named by Captain Cook, York Minster, from its fancied resemblance to that building. He describes it as a "wild-looking rock." Close to the Eastward of York Minster, there are several rocks and islets; one, on which the sea breaks violently, lies 2 miles E. ½ N. from the extremity 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. *Waterman Island.* *York Minster.*

Eight miles West of York Minster, and 4 miles South of the Western point of Waterman Island, are the Capstan Rocks, about 20 feet above water. There are no other dangers to seaward of a line from York Minster to the Phillips Rocks. *Capstan Rocks.*

Cook Bay is a large space between Alikhoolip and Waterman Islands. Broken land, islets, and breakers, surround and make it unfit for the approach of vessels. *Cook Bay.*

To the Eastward of Cook Bay there is an entrance to the Beagle Channel, and to the North-west a passage to Whale-boat Sound, but both are unfit for sailing-vessels, excepting with a fair wind.

About 4 miles S.S.W. ¾ W. from Alikhoolip, are the Phillips Rocks. They are dangerous, though above water, because so far from the shore, and so low. *Phillips Rocks.*

The Londonderry Islands are a large group which nearly fills up the space between the two last-mentioned passages. *Londonderry Islets.*

Treble Island is remarkable, having three peaks; and is visible from a considerable distance; near it are some straggling rocks. *Treble Island.*

Four miles to the Westward of the Londonderry Islands are Gilbert and Stewart Islands. *Gilbert and Stewart Islands.*

Between the two latter islands lies Adventure Passage, an open space, with deep water, and clear of danger. *Adventure Passage.*

At the N.E. side of the Eastern Gilbert Isle, there is a safe anchorage for a small vessel, called Doris Cove. There are no hidden dangers hereabouts; the eye and the chart will guide a vessel safely. *Doris Cove.*

The next promontory we meet in passing along the coast, is Cape Castlereagh; it is high and remarkable. Under this cape 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 nowhere more than 16 fathoms, generally from 6 to 12. The rocks just awash at high-water lie nearly in the middle of the harbor. A rock on which the sea breaks, lies one mile nearly W.S.W. of the middle opening to the harbor. There is no other danger. *Cape Castlereagh.* *Stewart Harbor.*

Wood and water, as in every Fuegian harbor, are plentiful and easily obtained.

Cape Desolation. Cape Desolation, the South point of Basket Island, is a very remarkable headland; it is rugged, with many peaks.

Desolate Bay. Between Cape Castlereagh 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.

London Isle. Townshend Harbor. London Isle is one of a large group called the Camden Islands. At its East end there is a safe anchorage called Townshend Harbor. The Horace Peaks point out its position. Some rocks, on which the sea breaks violently, lie off the islands, and near the entrance of Pratt Passage. 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 lee side of high land, 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 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, there are several 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.

Fury Harbor. At the South side of Fury Island, and N.W. by W. ½ W., 11 miles from the Northwestern point of London Isle, is Fury Harbor, a bad place, unfit for any vessel. There is little shelter, and very bad ground.

North Cove. At the North side of Fury Island a snug and perfectly safe anchorage, called North Cove, will be found. It is, however, only fit for small vessels. When there, they are in security; but 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 Harbor. Tom Harbor, fit for small vessels.

East and West Furies. The entrance of the Barbara and Cockburn channels, lies between Fury and London Islands. 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 seals being numerous upon them at times.

Barbara Channel. Four remarkable mountains point out the entrance to the Barbara Channel very distinctly. The Kempe Island peaks are high, and show three points. The Fury Island peaks are high and divided. Mount Skyring is high, and has a single peak. Mount St. Paul, from near Fury Island, appears very like the dome of the cathedral, the name of which it bears.

The situation of the rocks off the entrance of this channel, as laid down in the chart, is accurate; but no vessel should attempt to pass them without daylight and clear weather, so that she may steer more by a good eye at the mast-head, than by any chart.

Breakneck Passage is wide, and clear of all danger. I should prefer entering or leaving the Barbara Channel by this way to passing the Fury Rocks.

Agnes Islands. The Agnes Islands, and those in their neighborhood, do not require any description. They are so fortified by outlying rocks as not to be fit places for the approach of any vessel.

Stokes Bay. Northward of them is Stokes Bay, and to the Eastward a number of islands, between which lies the South-west entrance to the Barbara Channel.

No vessel ought to entangle herself in these labyrinths; if she does, she must sail by the eye. Neither chart, directions, nor soundings, would be of much assistance, and, in thick weather, her situation would be most precarious.

Noir Island. Noir Island is abont 600 feet above the sea, and with a remarkable neck of land to to the South-west, ended by a rock like a steeple or tower. One mile South of this point there is a sunken rock, over which the sea occasionally breaks: two other breakers are in the bight close to the point.

Noir Road. There is an excellent roadstead under the East side of Noir Island. Several ships may lie there secure from all Westerly winds, 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 larger vessels.

The large space between Noir Island and the Agnes Islands is extremely dangerous for shipping, being scattered with rocks, the Jupiters and Neptunes and many others; some just awash, some showing themselves several feet above, and 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 Easterly wind, in the event of anchoring in Noir Road. A rock lies in the road, and another, which is very dangerous, 4 miles to the Eastward. *Jupiter and Neptune Rocks.*

Seven miles S.S.E. of Noir Island are the Tower Rocks; they are high and quite steep to. A ship may pass close to either side of them. *Tower Rocks.*

Between Cape Schomberg on London Isle and Noir Island, lie many reefs, and a great number of detached outlying 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.

To the space between Kempe and Noir Islands, the name of the Milky Way has been given, as in every part of it rocks are seen just awash with, or a few feet above, the water. On them the sea continually breaks. *Milky Way.*

The Grafton Islands extend about 20 miles, in a North-west direction, they are high, and the remarks on the general character of the coast are applicable to them. Between them are several anchorages, but the best and easiest of access is Euston Bay. Behind them lies a passage, through which a sealing-vessel has passed. To the North-east of it is a mass of land, broken into islets and rocks. *Grafton Islands.*

Hope Harbor is one of those formerly used by sealing-vessels. *Hope Harbor.*

Isabella Island contains an anchorage fit for a sealing-vessel, but for no other. Rocks lie in the way to it. *Isabella Island.*

Cape Gloucester, the Western extremity of Charles Island, the largest and Westernmost of them, is a very remarkable promontory, and cannot be mistaken. At a distance it appears to be a high detached island; but, on a nearer approach, a low connecting isthmus is seen. A rock on which the sea breaks, lies nearly a mile to the North-west; there is no other danger. The cape may be passed quite close, being steep to. *Cape Gloucester.*

Cape Gloucester is a guide to Euston Bay, one of the best anchorages on this coast, as it 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. *Euston Bay.*

If coming from the Westward, on passing Cape Gloucester, a high island will be seen to the South-east, distant 7 miles; this is Ipswich Island, between which and Cape Gloucester lies Maria Bay, in which are many rocks and breakers. *Ipswich Island.*

Rounding Ipswich Island you must give a good berth to the rocks under water, which lie a mile from its South-east extremity. The sea does not always break upon them, but it does generally, and there is no other hidden danger. After clearing these rocks, pass close to Leading Island, and steer for the opening of Laura Harbor, which you will see under a high-peaked mountain. Choose your berth by the eye, if intending to anchor in Euston 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. *Laura Harbor.*

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 South-east 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. *Kelp Patch.*

The Fincham Islands may be next noticed in passing to the North-westward. Between these islands and Cape Gloucester lies the Breaker Coast, a large wild extent, full of rocks and breakers, and exposed to all the strength of Westerly 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 shore is broken into islands, islets, and rocks, almost innumerable. *Fincham Islands. Breaker Coast.*

Off Cape Tate, which is rather high, and rounded at the summit, are several clusters of rocks, the two Southern parcels are called the College Rocks; they are only seen when near the land. *Cape Tate. College Rocks.*

As a reference to the chart will show, there is no good anchorage hereabout, the coast is very dangerous and unfit to be approached.

Seven leagues to the N.W. of Cape Tate are the Landfall Islands, so named by Captain Cook, from seeing them first when he visited this coast. *Landfall Islands.*

Otway Bay. Inside, and to the Eastward of the Landfall Islands is Otway Bay, an extensive sheet of water, surrounded by broken land, islets, and rocks. Many of the latter are scattered about, and render it unfit for navigation. It is probable that passages lead from thence to the Straits of Magellan, as Dynevor and other deep inlets run in that direction as far as the eye can reach from the Landfall Islands; but they could not be explored for want of time.

Cape Schetky. Cape Schetky is a remarkable double-peaked height, at the South extremity of the Landfall Islands; some rocks just awash lie a mile off it.

Cape Inman. Cape Inman is a very remarkable headland at their Western extremity. Off this cape there are several detached rocks, on which the sea breaks violently, and gives them a formidable appearance. The outermost one is not 2 miles from the shore, and shows itself plainly.

Latitude Bay. Behind Cape Inman is Latitude Bay, an anchorage decidedly good, though somewhat exposed to a swell thrown in by heavy North-west winds.

Between the Landfall Islands there is a snug berth for a vessel not drawing more than 12 feet, in perfect security, and with smooth water; she should not moor in less than 10 fathoms, but keep as close to the Western shore as possible, with an anchor to the Eastward, in the event of the wind coming from that quarter. Water and wood are plentiful.

Cape Sunday. Cape Sunday, on Graves Island, is the next headland; it is high and prominent. Two islets and two dangerous rocks lie off it. Graves Island is the largest of a 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 an improper place for a vessel to anchor. Between the islands a small vessel may find a snug berth, quite secure, but difficult of access. The Beagle lay at anchor there a week, in 24 fathoms, good holding-ground. As before said, the eye must be the chief guide in entering most of these places: they are of one description—inlets between high ridges of land, having generally, deep water, and kelp buoying the rocky places. Flaws of wind and violent gusts off the high land render the approach difficult to all, and, to a large ship, impracticable.

Week Islands.

Barrister Bay. After passing Cape Sunday, Barrister Bay opens out, but it is an exposed place, full of islets, rocks, and breakers, and unfit for any vessel.

Cape Deseado. Five leagues to the North-westward of Cape Sunday is Cape Deseado, the highest land hereabout, and remarkable. A rocky islet lies a mile off the cape.

Two miles to the South-eastward of Cape Deseado there is an opening, which has not yet been examined, from whence to the cape the coast runs high and unbroken.

Dislocation Harbor. Four miles N.W. ½ W. from Cape Deseado 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. 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.

Judge and Apostle Rocks. Proceeding from Dislocation Harbor to the North-westward, the Judge and Apostle Rocks show themselves; they are from 5 to 50 feet above the sea, but many breakers near them indicate an extensive reef. The outer rock is 4 miles from the land.

Cape Pillar. At 3 miles N.N.W. from the Apostle Rocks, Cape Pillar projects to the North-west, being the extremity of Tierra del Fuego, and forming the Western entrance to Magellan Strait. The cape is in 52° 42′ 53″ S., and 74° 39′ 31″ W.

The tides between Cape Horn and Cape Pillar are regular as regards their rise, fall, and time of high-water, but not so with respect to their velocity and direction. It appeared 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 a knot, or more, according to the wind.

During six hours of falling water, or ebb-tide, there was little or no current setting along shore.

At Cape Horn it is high-water, full and change, at 3h. 30m.; at York Minster, at 3; and at Cape Pillar, at 1 o'clock. At the intermediate places the time gradually changes between those limits; and the rise varies from 4 to 8 feet. *High-water.*

General Observations upon the Sea-coast of Tierra del Fuego; its Seasons, Winds, and Weather.

From Cape Horn to Cape Pillar, the coast of Tierra del Fuego is very irregular and much broken; being, in fact, composed of a prodigious 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, except in daylight and clear weather. The coast varies in height from 800 to 1,500 feet above the sea. Further inshore there are ranges of mountains always covered with snow, their height being from 2,000 to 4,000 feet, and in one instance, Mount Sarmiento, 6,800 feet. *Cape Horn to Cape Pillar. Nature of the coast. Height above the sea.*

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. *Rocks buoyed by kelp. Kelp or sea-weed, a sign of danger.*

Viewing the coast from a distance, it appears high, rugged, covered with snow, and continuous, as if there were no islands; but when near, one sees many inlets which intersect the land in every direction, and open into large gulfs or sounds behind the seaward islands. The high land covered with permanent snow now disappears, and the hills close to the sea will be seen thickly wooded towards the East, though barren on their Western sides, owing to the prevailing wind. These hills are seldom covered with snow, because the sea-winds and the rain melt it soon after it falls. *Appearance of the coast. Appearance of the land.*

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 nearly so hard against high land as from it, but the sea on the weather side is of course too formidable, unless stopped by some barrier cape or islet. *Places fit for anchorage. Squalls.*

Where the land is chiefly composed of sandstone or slate, anchorages abound; where of granite, it is difficult to strike soundings.

The difference between granite, and slate or sandstone hills, can be distinguished by the former being very barren and rugged, and of a gray 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. *Granite sandstone and slate hills.*

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 everywhere a fine white or speckled sand. From 10 to 5 miles distance the average depth is 50 fathoms; though varying from 30 to 100, and in some places no ground with 200 fathoms of line. At less than 5 miles from the shore the soundings are very irregular; generally less than 40 fathoms, but in some places deepening suddenly to 100 or more; while in others a solitary rock rises nearly to the surface of the water. *Soundings.*

After carrying 50, 40, 30, or 20 fathoms, towards an inlet, which you are desirous of entering, you will possibly find the water suddenly 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.

A bank of soundings extends along the whole coast, and 20 or 30 miles in breadth, 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. *Outer Bank.*

Between the islands where there is no swell or surf worth notice, the water is deep, and the bottom very irregular.

A small vessel 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, dangerous.

Fogs are extremely rare on this coast, but thick rainy weather prevails, and strong winds. The sun shows itself but little; the sky, even in fine weather, being generally overcast and cloudy. A clear day is a very rare occurrence. *Fogs.*

Weather. 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.

Winds. Westerly winds prevail during the greater part of the year. The Easterly winds blow chiefly in the winter months, and very hard, but they seldom blow hard in summer.

Easterly winds. Winds from the Eastward invariably begin gently, and with fine weather ;—they increase gradually,—the weather changes,—and often 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.

North and North-west winds. From the North the wind always begins to blow moderately, but with thicker 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 North and North-west, 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 South-west quarter, blowing harder than before. The wind soon drives away the clouds, and in a few hours you have clear weather, but with heavy occasional squalls.

South-west wind. In the Sotth-west quarter the wind hangs several days, (generally speaking,) blowing strong, but moderating towards its end, and granting two or three days of fine weather.

Summer. Northerly winds begin generally during the summer months. but change continually 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.

Changes of the winds. 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. South-west and Southerly winds rise suddenly and violently, and must be well considered in choosing anchorages, and preparing for shifts of wind at sea.

Usual weather. The most usual weather in these latitudes, is a fresh wind between North-west and South-west, with a cloudy overcast sky.

Barometer. Much difference of opinion has prevailed as to the utility of a barometer in these latitudes ; but Captain Fitz-Roy, during twelve months' constant trial, found its indications of the utmost value. Its variations do not of course correspond with those of middle latitudes, but they do correspond with those of high Northern latitudes in a remarkable manner, changing South for North.

Currents. There is a continual current setting along the South-west coast of Tierra del Fuego, from the North-west towards the South-east, as far as the Diego Ramirez Islands. From them the current takes a more Easterly direction, setting round Cape Horn towards Staten Island, and off to seaward about E.S.E.

Much has been said of the strength of this current, some persons supposing that it is a serious obstacle in passing Cape Horn to the Westward, while others almost deny its existence. From the experience of the Beagle it appears to run at the average rate of a knot. Its strength is greatest during Westerly, and least or insensible, during Easterly winds. It is strongest near the land, particularly when close to the projecting capes or detached islands.

This current sets rather from the land, which diminishes the danger of approaching this part of the coast.

Coast not dangerous. 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.

Southerly gales. Gales of wind from the Southward, and squalls from the South-west, are preceded and may be foretold by heavy banks of large white clouds rising in those quarters, having hard edges, and appearing very rounded and solid.

North and North-west winds. 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 for a whole day, before a gale from the North or West, it is not possible to take an altitude of the sun although it is visible ; the haziness of the atmosphere in the upper regions causing its edges to be quite indistinct. Sometimes, but very rarely, with the wind light between N.N.W. and N.N.E., a few days of beautiful weather may occur ; but they are generally succeeded by gales from the Southward, with much rain.

Succeeded by Southerly gales.

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 best time for making the passage around the cape—in winter or in summer.

The equinoctial months are the worst in the year, generally speaking, as in most other parts of the world. Heavy gales prevail at those times, though not, perhaps, exactly at the equinoxes. August, September, October, and November, are the worst of all. Westerly winds, rain, snow, hail, and cold weather, then prevail. *Equinoxes.* *Spring.*

December, January, and February, are the warmest months, the days are long, and there is then some fine weather; but Westerly winds, which often produce very strong gales, with much rain, prevail even throughout that season, which carries with it less of summer there, than in almost any part of the globe. *Summer.*

March is the most boisterous month in the year, though not so rainy as summer. *March storms.*

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 often occurs even 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 endeavor 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. *Autumn.* *June & 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. Upon the whole the summer months, December and January, are the best for making a passage from the Pacific to the Atlantic, though that passage is so short and easy, that it hardly requires a choice of time. For going to the Westward, April, May, and June are preferable. *Passage round Cape Horn.*

Lightning and thunder are scarcely 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 a large size. *Lightning & Thunder.*

STATEN ISLAND AND THE ISLANDS OF CAPE HORN.

Staten Island lies off the South-eastern extreme of the American continent, and, like the Falkland Islands, is so deeply indented by bays as to form nearly four different islands. It offers a good departure to ships bound into the Pacific, as well as a landfall when returning. It is composed of lofty hills, the peaked summits of which retain through most of the year the snowy covering amassed during the long and dreary winter. The harbors are merely the continuation of the valleys, and consequently all preserve nearly the same direction, and are surrounded by high land, the water in them deepening rapidly towards the centre. The coast consists everywhere of rocky cliffs elevated from 200 to 500 feet, and have generally from 15 to 20 fathoms water close to their bases. *Staten Island.*

The velocity of the tides is very great, and as they meet with constant obstacles from the manner in which the headlands jut out at right angles to their directions, there is produced, when the wind is strong and contrary, a rough cross-breaking sea which is impassable by a boat, and even dangerous to a ship of considerable size. *Tides.*

There is also reason to believe that the meeting of the two flood-tides coming round Cape Horn, and through the various channels of Tierra del Fuego, contributes to the unusual agitation of the sea in the vicinity of Staten Island. The flood comes from the Eastward along the Northern shores of the island, and continues its course Southward through the Strait of Le Maire, varying in velocity from 5 to 7 knots. To the Southward of the island but little amount of tide is perceptible; there is, however, a remarkable undertow, which renders it dangerous for boats to stretch across the mouths of the deep bays, as it is difficult to close again with the land; and for this reason the sealers invariably follow the circuitous route of the shores. The times of high-water, at full and change, at Cape St. Bartholomew and Cape Horn are 3h. 50m. and 4h. 30m. respectively, showing that the great tide-wave of flood comes from the South-west. This seems to point out that Staten Island, standing with its extreme length about N.E. and S.W., or nearly at right angles to its direction, receives upon its Southern shore the whole force of the flood, which having passed Cape St. John, follows the direction of the coast to the Westward, where it meets the flood coming down the Eastern side of the South American continent, and also that proceeding from the Strait of Magellan, together with those streams that find their passage between the islands of Tierra del Fuego. This heaping together of the tides in one place from such a variety of directions, would be quite sufficient to account for the constant state of agitation exhibited by the surrounding sea of Staten Island, even in moderate weather, without taking into account the prevalence of Westerly gales of the most violent character. *High-water.*

Harbors. The harbors of Staten Island are with one exception confined to its Northern side; they are, St. Johns Harbor, Port Cook, New Year Harbor, Port Basil Hall, Port Parry, Port Hoppner, and Port Vancouver. There are also two or three small bays in the Strait of Le Maire, but they are rendered unsafe by their exposure to the prevalent Westerly winds. All these anchorages, though well protected when once gained, are more or less difficult of access from the force with which the tides set across the mouths of the inlets, the depth of water, and variableness of the wind, which in every instance, except that of blowing immediately lengthways of the port, finds its way down the ravines of the mountains in various directions, according to the peculiarity of their form.

New Year Islands. The New Year Islands afford a sort of protection from Westerly winds, and there is anchorage under the North-easternmost in 17 fathoms; but it cannot be recommended, being open to the influence of all winds between N. and E.S.E., the bottom rocky, and the tides rapid, while the eddies are so uncertain in their distance from the island, that it is by no means easy to keep a ship clear of her anchors.

St. Johns Harbor. St. Johns Harbor is the Easternmost in the island, and may be easily recognized at a distance by Mount Richardson, at the base of which it is situated. On nearing it a remarkable cliff like a painter's muller, appears on the Eastern shore, which is high and steep. Allowance must be made in steering for the harbor for the set of the tide, which at all times runs rapidly across its mouth; it is, however, less sensible when within the headlands forming the North-west bay, in which in case of necessity, or to await the turn of the tide, an anchor may be dropped in from 20 to 30 fathoms. The mouth of the harbor is wide, having 25 fathoms in the centre, with a rock standing off at some distance from the Western point, to which a berth must be given. The shores, with this exception, are bold, and immediately within the Western point is a small bay, where anchorage may be had in 10 fathoms. The most sheltered situation is at the head of the harbor, distant from the entrance 3 miles S.S.W., where a vessel may choose any depth between 20 and 5 fathoms, with sandy bottom, and moor with an open hawse to the S.W., from whence the gusts that come from the mountains are violent. The wind, anything to the Westward of N.N.W., or even N.W. outside, will be found to draw out of the harbor on nearing its head, and if at all strong, it will be impossible to beat further, as it follows the direction imparted to it by every ravine in the hill as it passes; and therefore warping will be found the only means of advancing, taking care to have hands by a bower anchor ready to let go, and the cable stoppered at a short scope, in the event of the hawsers being carried away. A ship may readily heave down on a beach of sand at the head of this harbor. Wood and water are plentiful and easily procured.

Wood and water. The shores of St. Johns Harbor are lined with kelp, which is an excellent indication of its navigable part, the border of it being almost invariably in 8 fathoms, and that close to the shore, the depth rapidly increasing towards the centre, until near the head of the harbor, where the depth gradually decreases to the beach.

Port Cook. Port Cook is the most eligible harbor in Staten Island for a ship in want of shelter, from the good anchorage at its entrance in not too deep water, the greater regularity of the prevailing winds, and the facility of communication with the South side of the island, by means of the low isthmus separating it from Port Vancouver.

Port Basil Hall. Port Basil Hall is separated by a narrow neck of elevated land from the head of New Year Harbor, though their mouths are 2¼ miles apart. This is a most convenient anchorage when once attained, and well sheltered from all winds, though the depth of water and contraction of its mouth by two detached rocks render it difficult of entrance without a commanding breeze and favorable tide. There are three rocky patches nearly in the middle of the space within the entrance, but all the danger is pointed out by the kelp and the tops of the rocks themselves, which show at half-tide: they must be passed on the Eastern side, where there is a space sufficiently wide to admit of beating in moderate weather. The best anchorage is between a small green island on the Western shore, and a fine sandy beach to the Northward of the island; it gives from 7 to 10 fathoms, and the island may be passed on either side, taking care to avoid a rocky ledge that runs off its South-east extremity. Although the whirlwinds common to all the harbors of Staten Island are found to exist here, yet the comparative lowness of the South-western shore renders them less violent than in many of the others; and the New Year Islands afford some protection to the harbor from the sea, by stretching, though at a distance, across its mouth.

Wood and water. Wood and water are abundant, and a fine sandy beach abreast of the anchorage affords facility for a small vessel in want of repair.

There is anchorage on the Eastern side also, in a bay just within the entrance, but it cannot be compared with the other, being exposed to the swell that rolls in from seaward, and open to the influence of Westerly, the prevailing winds. The best directions for entering the port are, after having passed the rocks in its mouth, to steer for a remarkable peaked hill, the Easternmost of two near the head of the harbor,

until another peaked hill, on the Western shore, which stands by itself, comes into view, after which the course may be shaped so as to pass the island on the Northern side, where the best anchorage will be found.

Port Parry.

The entrance of Port Parry may easily be distinguished by its being the first opening to the Westward of New Year Islands, and by Buckland Peak on its Eastern side, the quoin-shape appearance of which renders it a very remarkable object. There are detached rocky islets off both the points of entrance, but they are bold and steep, and there is no danger to be apprehended from approaching them.

The harbor itself is divided into two parts by the near approach of its opposite shores, about 2¼ miles from the entrance, after which they again expand, forming a well-sheltered and secure anchorage.

The depth of water in the gorge of the inner harbor is 8 fathoms, and the breadth about 150 feet; and after having passed it, the Eastern point of the outer entrance should be brought in one with the Eastern point of the gorge, in order to lead clear of two rocky patches that lie one on either side within it, and are pointed out by the kelp growing on them.

There is good anchorage in 9 or 10 fathoms to the Southward of a small grassy island on the Eastern shore of the inner harbor, with sandy bottom, after which the water again deepens to the head of the harbor, where a vessel may be moored with an open hawse to the S.S.W., opposite to a sandy beach—the place in which the observations were made.

The deepest water is on the Western shore, more particularly abreast of a perpendicular cliff opposite to the small island before mentioned. In this harbor, wood and water may be got on board with facility, and clams may be caught by a scissors-shaped rake to detach them from the sand at low-water.

There is a rocky patch having 4 fathoms on it nearly in the centre of the outer port, and as the water gradually shoals all round it, a vessel might find a temporary anchorage. The depth of water in the Western arm is an objection to it as a place of long continuance for a ship, but the bottom is good, and both wood and water may be procured, though the swell that rolls in on the rocks would be very destructive to the boats on landing; there is, however, a convenient place for the employment of a hose for watering. The hawse should be open to the Westward, in the event of mooring.

After entering the outer harbor, there is no bottom with 30 fathoms, until near the contraction; and the Western shore should be kept on board if the intention be to anchor in the Western arm of the outer harbor. If bound into the inner harbor, the Eastern shore should be hugged tolerably close until abreast of the white ravine. Unless with a leading wind, it would be impossible to sail through the contraction. If the wind is found to baffle on nearing it, the sail must be taken off the ship and preparations made for towing or warping; indeed it would be perhaps better in all cases to adopt those precautions, as the height of the surrounding land frequently causes flaws that might, in so narrow a channel, drive the ship on shore before the sails could be trimmed.

To this harbor the sealing-vessels are accustomed to resort when in want of repairs, or as a place of shelter while their boats are absent in the pursuit of furs; in this respect it is, however, very inferior in point of convenience to Port Cook, for though the distance across the island from the head of the harbor hardly exceeds the breadth of the isthmus at Port Cook, and there is a boat-harbor on the Southern shore nearly opposite, yet the elevation of the land is too great to admit of a communication being kept up without two separate establishments.

From the height of the land also the squalls are frequent and violent, though not sufficient to cause apprehension to a ship well moored.

Port Hoppner.

Port Hoppner is the next opening to the Eastward of Cape St. Anthony, and is divided from Port Parry by a peninsula of 2 miles between Isabella Point, the Western point of Port Parry, and Austin Point, the Easternmost of Port Hoppner. Abreast of the Western arm of Port Parry, however, the distance across the neck of land does not exceed half a mile. This harbor is also divided into two parts, like Port Parry; it has a high rocky island in its mouth, by which it is protected from North-westerly winds, and which affords anchorage for the space of half a mile within it, in from 20 to 8 fathoms. To the South-east of this island, however, there is a continuation of rocky patches, and two pinnacled rocks peep above the water's edge, and are surrounded by abundance of kelp. Near the head of the outer harbor, there is also anchorage close to the shore, which on the Western side is high and precipitous. The gullet is not more than from 25 to 30 yards broad, with from 2 to 4 fathoms in it; yet the sealers sometimes haul their small schooners through into the inner basin, where they are completely secure from all winds in from 20 to 6 fathoms, and moor by hawsers to the rocks. The tide rushes through the narrow openings with great velocity; it would be prudent, therefore, not to commence warping in until the last-quarter flood.

A tolerably-sized stream falls into the head of the inner basin from the mountains by which the whole of the harbor is surrounded. In the outer harbor there are no soundings in the centre with 40 fathoms of line. Wood and water are here tolerably plentiful; but the harbor is by no means so convenient or so secure as either of those previously mentioned.

Flinders and Crossley Bays. Port Hoppner is the Westernmost harbor in the island, but anchorage may be found in the small coves on the Eastern side of Flinders Bay, and also in Crossley Bay; they are, however, open to the prevalent winds, and unprotected from the sea, and can by no means be recommended.

Port Vancouver. On the South side of Staten Island, the only well-sheltered harbor is Port Vancouver, immediately opposite to Port Cook, from which it is separated by a low isthmus. In it a vessel may ride in security in 16 or 17 fathoms, sandy bottom, close to a rivulet, and near a convenient wooding-place in the Western arm. There is a rocky island on the Eastern side of the entrance which is always visible, and a reef extends some distance from the South point of the Western arm, which may be avoided by not hauling in for the anchorage there until a remarkable white ravine on the South shore becomes visible. These are the only dangers; and in this harbor the same advantages of communication with the other sides of the island, by means of the isthmus, are offered as in Port Cook, while it possesses the important one of affording a place of refuge during a S.W. gale. It may easily be recognized from seaward by its being the first opening to the Eastward of Dampier Islands, from the Southernmost of which it is distant 4½ miles. A ship must moor with an open hawse to West.

Back Harbor. Back Harbor cannot be recommended, on account of the heavy rolling sea that sets into it with S.W. winds, the scarcity of wood, and difficulty of procuring water, in consequence of the surf that breaks on the beach. The holding-ground, however, is good, and small vessels have rode here occasionally in N.W. winds.

Tides. The time of high-water, at full and change, is about 4h. 30m., and very nearly the same in all parts of the island; the rise and fall is from 7 to 9 feet.

Natural History. The seal, the otter, the rat, and the mouse are the only quadrupeds on Staten Island. Birds are more numerous, and comprise three species of penguins, gulls, albatrosses, and shags, of which the crested shag form extensive flocks, building their nests in the loftiest trees on the hills.

THE HERMITE, OR CAPE HORN ISLANDS.—The whole of these islands are composed of greenstone, in which the hornblende and feldspar are more or less conspicuous, and the presence of iron very apparent, as already stated. Their shores are bold; and the mountains are peaked, rising with a steep ascent to an elevation of from 1000 to 1700 feet above the level of the sea; and being thickly clothed to within 200 or 300 feet of their summits with different sorts of shrubs and evergreen-trees, render them difficult of access.

St. Martin Cove. The entrance into St. Martin Cove bears from Cape Horn W.N.W. ½ W., from which it is distant about 10 miles, and is further distinguishable by Chanticleer Island, that lies about a mile due N.E. from South Head. In this direction there are no dangers but what show themselves, and the cove is of easy access with N.E., E., or S.E. winds; but with the Westerly winds that prevail here it is quite the reverse, and ships then should anchor off the entrance in about 22 fathoms, and warp into the cove, where there is a convenient berth in 18 fathoms, sandy bottom, midway from either side, and about half a mile from the head of the cove. This anchorage is safe, although the gusts of wind in Westerly gales (which are of frequent occurrence at all seasons of the year) rush down the sides of the mountains in various directions with impetuous violence, and may be very properly called hurricane squalls. They strike the ship aloft and have more the effect of heeling a vessel than of bringing a strain upon the anchors, which, when once imbedded in the sandy bottom, hold remarkably well, and will cost a heavy heave in weighing.

Wood and water. Wood and water are in abundance in every part of the cove, but cannot always be procured, from the steepness of the shores and the heavy swell that sometimes sets in. The water is highly colored by the vegetable matter through which it percolates, but we found no inconvenience from its use than that of giving to our tea a deeper color, and somewhat unpleasant taste. The wood was very much twisted and stunted in growth, and did not appear fit for any other purpose than fuel.

Tides. Time of high-water, at full and change, 3h. 50m. Rise about 8 feet; but the swell that sets into the cove rendered the observations both on the times and on the rise and fall very uncertain. There was no very decided direction observed in the stream of either tide, which was very slack; but it appeared that the flood came in from the Southward amongst these islands.

Currents. At the distance of 3 or 4 leagues to the Southward of Cape Horn, however, there is a current running to the E.N.E., at the rate of about one mile per hour; but in what manner this current may influence the tides near the shore, or what changes may be produced in the direction and strength of the current itself by the flood and ebb tides, will require a very extensive set of observations to ascertain.

The circumstance of there being no well-authenticated account of the existence of a current to the Southward of Cape Horn, induced me to throw together the following observations upon that subject, made during the passage of His Majesty's sloop Chanticleer, from Staten Island to Cape Horn, from Cape Horn to South Shetland, from South Shetland to Cape Horn, and from Cape Horn to Staten Island, during the summer and autumnal months of those regions.

The ship's way through the water was measured by Massey's self-registering log, and the variation of the directing compass was ascertained by actual observation on the course steered, whenever the state of the weather would permit. The local attraction of the Chanticleer did not exceed two degrees in extreme cases.

The observed places of the ship were computed with every possible care and attention.

The following tables comprise those observations :—

Date.	Latitude South.	Long. West.	Temperature. Water.	Temperature. Air.	Apparent set of Current. True bearings.	Current deducted. True bearings.
		From Staten Island to Cape Horn.				
1828.	° ′ ″	° ′ ″	°	°	deg. mls. hrs.	
22d December.....	54 44 55	63 29 00	46·5	49·0		
24th "	55 56 11	62 08 00	44·0	43·5	N. 20 E. 15 in 42	
25th "	56 31 49	63 05 45	44·0	46·0	S. 63 E. 13 in 24	N. 80° E. 11° 6′ in 24 hours.
26th "	56 51 30	66 17 12	44·0	45·0	S. 50 W. 8 in 24	
27th "	56 12 42	66 51 38	50·0	56·5	N. 26 E. 18 in 16	
		From Cape Horn to South Shetland.				
29th "	56 18 00	67 28 00	47·5	45·0		
31st "	56 56 40	65 32 30	42·5	43·5	No current observed.	
1829.						
1st January	57 39 43	64 58 12	41·5	44·0	N. 57 E. 41 in 24	S. 65° E. 11′ in 24 hours.
2d "	59 35 43	65 16 18	38·5	41·5	S. 55 E. 15 in 24	
3rd "	60 26 57	65 28 00	36·0	39·0	S. 24 E. 7 in 24	
5th "	62 58 00	63 01 30	34·5	38·0	N. 75 E. 13 in 48	
		From South Shetland to Cape Horn.				
9th March	62 30 38	62 31 00	34·5	39·0		
12th "	61 47 38	64 22 00	36·0	37·5	N. 25 E. 37 in 72	
14th "	58 53 42	62 29 30	38·0	39·5	N. 51 E. 54 in 48	
16th "	58 37 54	64 36 00	41·5	43·0	N. 70 E. 14 in 48	
18th "	56 55 30	63 57 30	42·0	43·0	North 69 in 48	
19th "	56 21 14	63 57 42	44·0	45·5	N. 12 W. 6 in 24	
20th "	56 51 16	65 18 40	44·0	45·5	West 22 in 24	N. 49° E. 21′ in 24 hours.
22d "	57 21 00	65 27 30	43·5	46·0	S. 80 E. 52 in 48	
23d "	57 36 00	66 02 30	42·0	43·5	S. 70 E. 32 in 24	
24th "	56 42 30	67 07 36	43·0	42·0	N. 71 E. 26 in 24	
25th "	55 59 48	67 19 30	47·0	48·0	N. 72 E. 20 in 25	
		From Cape Horn to Staten Island.				
24th May	55 59 30	67 14 00	45·0	44·0		
25th "	54 48 47	63 18 00	41·5	42·0	N. 51 E. 54 in 23	N. 51° E. 54′ in 23 hours.

The effect which these observations appear to point out is that an Easterly motion of the sea, in the vicinity of Cape Horn, is produced by the prevalence of N.W., W., and South-westerly winds; and although its direction is sometimes much to the North, as well as to the South of East, this deviation, in all probability, arises from the prevalence or greater strength of the N.W. or S.W. winds during the intervals between the observations, as it was generally remarked that the deviation of the current from the E., towards the N. or S., was in accordance with the prevalence of one of these winds over the other during the above interval.

The strength of this set appears also to be much influenced by that of the wind, for, during the voyage from Cape Horn to South Shetland, it was found, at the time of meeting with N.E. winds in the parallel of 60° S., that the set to the Eastward was diminished in its velocity to about half the amount we had previously experienced.

From these several irregularities, the individual observations do not admit of any very satisfactory conclusions being drawn; but taken collectively, they indicate an Easterly or North-easterly set, as shown on the last column of the table: on looking over which it will be seen that in the voyage from Staten Island to Cape Horn, a current setting N. 80° E., at the rate of 12 miles in 24 hours, may be expected in the summer months, and that between Cape Horn and South Shetland, a current setting S. 65° E., of equal strength, was experienced during the same season of the year: while in the autumnal months this current was found to set N. 49° E., with nearly twice the velocity. All this seems to indicate that the winds from the South-western quarter, in autumn, are more violent and of longer duration than in the summer season: and indeed, on a review of the winds during the passages in the different seasons alluded to, it was found that N.W., W., and S.W. winds exceeded those from all other quarters put together, in the month of March, in the ratio of 4 to 1; while in the summer months, and during an equal interval, these winds were found to exceed all others in the ratio of 2 to 1 only; which points out at once, apart from other circumstances, that the most advantageous part of the year for rounding this noted promontory is the summer months of those regions. And, from the strength and frequency of the gales that were experienced in the month of March, I am induced to recommend the summer season as the proper time for the navigation of those seas; particularly as at that season North-easterly winds may be expected in the parallel of 60° South; and as, in all probability, they continue to blow in a high Southern latitude throughout the summer, for we found the North-easterly winds to be the prevailing winds during our residence at South Shetland in the months of January and February.

Time for rounding Cape Horn.

The next and most important conclusion to be drawn from these observations is, that the set of the flood-tide round Cape Horn comes from the S.W.; such, at least, seems to be the case from the observations made during the passage of the Chanticleer from Cape Horn to Staten Island, in May, 1829; for, at the time of taking our departure from Cape Horn, it was ascertained to be nearly low-water; and on our arrival off Cape St. John the flood-tide had just made its mark. The passage from Cape Horn to Staten Island was performed in 23 hours, in which interval we had felt the whole influence of two flood-tides, while that of one ebb only had been experienced; and on comparing the ship's place, ascertained by bearings at the time of our departure from Cape Horn, with the dead-reckoning, on our arrival off Cape St. John, and kept in the most unexceptionable manner under very favorable circumstances, viz., fine weather, a free though side wind, and the ship's way through the water measured with a self-registering log, a set N. 51° E., (true,) at the rate of 54 miles in 23 hours, was experienced; from which, if 24 miles be deducted for the effect of the previously established current at this season, we have 30 miles for the set of the flood-tide at neaps, or about 3 miles per hour. It is also to be considered that in advancing to the Eastward the flood-tide is prolonged, and, on the contrary, the ebb is curtailed. How far the strength of these tides may have operated in producing some of the irregularities in the North-easterly set of the sea, deduced from the previous observations when near inshore, by having been influenced by either tide for a longer period in the interval between the observations, I have not ascertained; but from some notes which were made at the time, I have every reason to believe that the tides caused part of the irregularities in question.

THE FALKLAND ISLANDS.

Vessels bound into or from the Pacific by way of Cape Horn, if disabled or wanting supplies, will find Port Stanley, on the East side of the Eastern Falkland Island, the nearest and best place when South of the River La Plata. The following are the directions published by the Admiralty:

All vessels intending to touch at this group, and coming from the Northward, should endeavor to get soundings off Cape Corrientes, in about 39° S. latitude. If their longitude is incorrect, they would thus be able to correct their position; for the edge of the bank is so steep that, in a distance of 10 miles, the depth changes from 100 fathoms no bottom to 60 fathoms sand; and by sounding every 2 or 3 miles, until the edge of the bank is hit in about 80 or 90 fathoms, a vessel might obtain her longitude within a very few miles of the truth. In the parallel of 39° S., the edge of the bank is in 55° 45′ W. longitude; in latitude 41°, in about 56° 55′ longitude; in latitude 45°, in about 60° longitude; and in latitude 46° S., in about 60° 15′ W. longitude.

Should a vessel be unable to get in with the coast so as to strike the edge of the bank as far North as 39° S. latitude, she should endeavor to do so as soon afterwards as possible; taking advantage of every Northerly and N.W. wind to steer about S.W., in order to make up for what she is certain to be driven to the S.E. when the wind draws to the S.W., which it does at least every second or third day. By persevering in getting to the S.W., whenever the wind will allow it, until to the Westward of 60° W. longitude, there will be no fear of being driven to the N.E. of the islands; whereas, if a vessel make a straight course for the islands when the wind is fair, she will be certain of being driven to leeward by the frequent South-westerly winds, and find great difficulty in getting to windward again. Having, if possible kept as far to the Westward as 60° W. longitude, until in 49° 30′ S. latitude, soundings will be obtained on the bank to the Northward of the Falklands, in about 80 to 85 fathoms, fine dark sand. If the longitude can be depended on, a course may then be steered to make the land about 20 miles to the Westward of Volunteer Point; but if the position of the vessel is doubtful, or the wind drawing round from the N.W. towards the S.W., it would be better to keep to windward, so as to make the Eddystone Rock, which is seen well from a vessel's deck about 8 miles off, and exactly resembles a ship under all sail when seen at that distance. It can be seen in the darkest night (if the horizon is clear) before a ship would be in danger, as there is deep water close round it; but if the longitude is uncertain, it would be better, in the night, not to run on, after shoaling to 50 fathoms, should the wind be towards the shore, as a vessel might pass the Eddystone, and become embayed in the deep bight to the Westward of it. The same rule should apply in thick weather, which is always the case with Northerly and N.E. winds; but if a vessel has had observations shortly before, and can depend on her position, she may run for the N.E. point of the island in any weather; and if the land is not seen about Macbride Head, or Cape Carysfort, when the water shoals to 40 fathoms, her head should be put off shore until daylight, or until a break in the thick weather enables the land to be seen; but the days of thick weather are very few, and it is not often that the land cannot be seen when 20 miles off.

Eddystone Rock.

First appearance of the land.

The first appearance is very unfavorable; rugged hills, the summits of which are stony and very light-colored, have made many suppose that the high land is always covered with snow, but this is rarely the case from October to April or May, except patches in the hollow of the mountains, which sometimes remain till November.

Macbride Head.

Cape Carysfort.

Cow Bay.

Uranie Rock.

Mount Low.

In coming from the Northward, the most Eastern hills seen are those immediately over Berkeley Sound; by steering for them, when within 6 or 7 miles of the land, the cliffs of Macbride Head and Cape Carysfort will be plainly seen. Both these capes, and a projecting point between them, have small detached rocks lying off them, which show plainly in coming from the Westward. Cape Carysfort may be passed at a mile distance, and the low land and rocky islets which form Volunteer Point, will then be distinctly seen. Cow Bay lies a couple of miles to the Southward of Cape Carysfort, and affords clean sandy anchorage in 7 or 8 fathoms, but open to the Eastward. It is easily known by its white sandy beach, and the bluff land about the cape; and, at the close of the evening, vessels bound to Stanley might find it convenient to drop an anchor here for the night. A berth of 2 miles should be given to the rocky islets off Volunteer Point, in order to clear the Uranie Rock, on which a French frigate of that name struck. It is the more dangerous, as with Westerly winds the sea seldom breaks on it, and it is the only rock of the whole group on which no kelp grows. The best marks to clear it, particularly in the night, are the bearings of Cape Carysfort and Mount Low. By keeping Cape Carysfort to the Westward of W.N.W., until Mount Low bears S.S.W. ½ W., a vessel will pass nearly 2 miles outside of it, and may then haul up for Mount Low, which is the most Eastern high hill on the island, and may easily be seen, in a clear night, when to the Northward of Volunteer Point; the summit, which is 840 feet high, forms two peaks, and from the Eastern one the land slopes down to the point that divides Berkeley Sound from Port William.

Berkeley Sound.

The entrance to Berkeley Sound is seen opening out directly after passing Volunteer Point, and cannot be mistaken either by night or day. This capacious bay may be said to lie between Aigle Point and Kidney Island, and is therefore 4 miles wide

at its entrance, and upwards of 5 leagues in length, terminating in the three excellent anchorages of Johnson Harbor, Stag Road, and Port Louis. After passing Aigle Point, from which a reef extends half a mile to the Eastward, the sound is clear of all danger up to Sea-lion Rocks. These rocks make at a distance like two or three small boats; and vessels bound to either of the above three anchorages should in the first instance steer for these rocks, the dangers round which are well marked by kelp.

Johnson Harbor. The entrance to Johnson Harbor is two-thirds of a mile in breadth, from kelp to kelp, which shoots up there in 5 or 6 fathoms, and well marks the limits of the channel. Off Lamarche Point the kelp will be seen to run out a long way, with another large patch opposite to it, which together narrow the passage to a third of a mile. After clearing these, the vessel may boldly proceed up the harbor and anchor off Magellan Cove, in from 5 to 6 fathoms, mud. The Conway found the ground there so tough that in weighing the anchor the head of the capstan was wrung. The watering-place is at the N.W. corner of Magellan Cove, but it is inconvenient, as the beach shelves out a long way, so that the people are obliged to roll the casks some distance, and are therefore constantly wet. If not in want of water, a better berth may be found further to the Westward, for the sake of shelter during heavy S.W. and Southerly gales, which raise a heavy sea off Magellan Cove. The landing, also, is more sheltered on the Western shore; and that side of the harbor abounds with rabbits.

Stag Road. Stag Road offers a still better anchorage for large ships off Bougainville Creek; the two large kelp patches may be passed as close as possible, and the largest ship may work in, and anchor in 4½ or 5 fathoms in any part of the road. The best berth and the best ground will be found mid-channel between Hog Island and the North shore; but it is 2 miles from the watering-place, which is to the Westward of the Carenage.

Berkeley Sound is the only place, on the East coast, that can be entered by night, if the entrance has been made out before; and even worked into safely, by standing close to the shore on each tack till nearly abreast of Johnson Harbor, where a ship can anchor in from 12 to 15 fathoms, outside the kelp patches off Long Island, but rather to the Southward of mid-channel, to avoid getting too close to the Sea-lion Rocks, which cannot be seen in a dark night.

Port Louis. Port Louis lies in the Western extremity of the bay. The entrance is between Long Island on the South and Peat and Hog Islands on the North; but a rocky patch nearly mid-channel contracts the passage to a little more than a cable's length. After passing this narrow gullet, keep to the Northward of Round Island. This anchorage is nearly landlocked; the most convenient berths for small vessels are off the Carenage, in 3 fathoms, about a quarter of a mile from the shore, or further over to the Southward in 3½ or 4 fathoms.

The Carenage, at its entrance, is scarcely more than 100 yards across, but expands to a sheet of water of nearly a circular form, and nearly half a mile wide; from the shoalness of the water, however, it is only adapted for boats. The old settlement was on its Western side.

Tides. It is high-water at Port Louis, full and change, at 5 o'clock, and the rise of tide at springs does not appear to be more than 7 feet.

Port William. The entrance to Port William cannot be made out well till near the land. With a fair wind, after rounding Volunteer Point, Mount Low should be kept about a point on the starboard bow; some white sand-hills will then be seen ahead, and close to Kidney Island; at the same time the Seal Rocks, which form the extreme of the South entrance to Port William, will be seen on the horizon, just open of Cape Pembroke, and about two points on the port bow. By continuing on this course till within a mile of Kidney Island, (which can be approached in safety to within a quarter of a mile,) the Northern point of the entrance to Port William (William Point) will be made out clearly; it is low and rocky, and has *tussac* growing on it, which has the appearance of low green bushes, and is easily distinguished from the rest of the land. This point may be passed within a cable's length, and the entrance to the harbor will be seen bearing S.W. The port is entered after passing William Point, and there is good anchorage in the bay, between it and Cape Pembroke, in from 11 to 12 fathoms, sheltered from all the prevailing winds. The next point is Charles Point, about two miles further; it has two small detached rocks at its extreme, off which there is a kelp patch, extending about one-third of a mile; there is deep water close to the edge of the kelp. Yorke Point, on the South side of the harbor, and the islets to the Eastward of it, are all steep, and may be approached within 100 yards; the entrance is wide enough for a line-of-battle ship to work in, and the edge of the kelp is a secure guide; but the white sandy bay on the South side should not be entered, as it is shallow. In standing towards it, a vessel should tack when in the line of the islets and of Yorke Point. Immediately this point is passed, Sparrow Cove will be seen open on the North side of the harbor, under Mount Low, and the entrance of Stanley Harbor (where the settlement is now) on the South side. If the wind is Southerly, the

Seal Rocks.

White-sand Bay.

Stanley Harbor.

passage into Stanley Harbor should not be attempted, except by a small quick-working vessel; but, with the wind to the Westward of S.W., it may be passed by the largest ships; it is little more than a cable's length broad, but both points can be passed within 30 yards. If the wind is S.W., so as to make it necessary to pass very close to the Western point (Navy Point) to fetch through, a vessel should work up well to windward of the entrance, and entering the passage under all sail and with good way on, directly the sails lift from the wind drawing out in passing the point, she should be kept a little higher, so as to shoot through with the sails shaking till she gets the steady wind inside the point. When through the Narrows, the harbor may be traversed by any vessel under the size of a line-of-battle ship; there are 3½ fathoms a cable's length from the kelp on each side, and above 4 fathoms in mid-channel, close up to the site of the town, which is about 2 miles to the Westward of the entrance, on the South shore. The largest ships have plenty of room to round to and anchor in mid-channel, in about 5 fathoms, as far up as they choose to fetch. After passing the Narrows, the bottom is excellent—a stiff mud, which often causes some trouble in getting the anchor up again.

Water. The greatest drawback on Port Stanley was its want of running water near the settlement; but several wells have been recently sunk by its present active governor, and all vessels can now depend on a ready supply. Good and cheap beef may be obtained in any quantity, and wild fowl and fish are also very abundant.

Wood. Wood cannot be had, but *peat* which is a fair substitute for it, is plentiful, and when compressed, is found to be a valuable fuel.

Above Port William anchorage, a long creek winds through the hills to the Westward, up to Murrell River; its whole extent being about 3½ miles. It varies in width from one-fifth of a mile to half a cable's length for the first mile, with a depth of 3 to 2 fathoms, beyond which it shallows rapidly, so that a boat cannot get up till the tide begins to flow. The landing on all the beaches is very bad in consequence of the scattered fragments of quartz rock from one to three feet long, which may greatly injure a boat if she touches them; the only safe landing is on the rocks where the shores are steep to. There is a very good watering-place on the West side of the cove on the North shore, in a bight outside the entrance to Weir Creek; but care must be taken in landing on account of the stones. Nearly every hollow has a small stream running through it, and peat may be dug in several places.

The shores of this port seem to be the favorite resort of the wild horses; but the horned cattle are never seen there, as they keep on the low grounds to the Southward of the hills.

Sparrow Cove. Vessels that remain in Port William will find good anchorage in Sparrow Cove, and an unfailing supply of good water in its N.W. corner. In Port Harriet there is a good stream in a cove on the North shore, about a mile inside the entrance.

Ships bound round Cape Horn should not enter Stanley Harbor, as the wind which would be fair for them to sail, would be foul for getting through the Narrows; they may anchor outside the entrance about a quarter of a mile N.W. of them.

Vessels coming from Cape Horn might always go into Stanley Harbor, as any wind which would be fair for them to sail, if bound to the Northward, would also be fair to leave the harbor.

Large ships, when abreast of the entrance, in coming up Port William, not intending to enter Stanley Harbor, should stand towards the Narrows till they shut in the entrance-points of Port William, when they will have from 6 to 7 fathoms, about one-third of a mile from the shore, and can easily leave with any wind.

Beauchene Island. Vessels from the Southward, wishing to call at Port William, should make Beauchene Island, which is about 2 miles long, and half a mile wide. Its Northern point rises to a green mound about 200 feet high; the Southern end is less than half that height, and is all rocky, covered with birds and hair-seals. It is in latitude 52° 54′ 45″ S., longitude 59° 12′ W.; the South and East sides form high cliffs, but the West side slopes gradually to the sea. There is no danger within a quarter of a mile of the shore, so that it may be run for in safety.

Making Port William from the Southward. In coming from the Southward the lead will not be a guide, as Beauchene is on the Southern edge of the bank which surrounds the Falkland Islands; and within 4 miles of the South point there is not any bottom with 100 fathoms. After passing outside Beauchene, a N.N.E. course for 60 miles will clear all the islands off the S.E. coast of the East Falkland, and the depth then will be from 50 to 56 fathoms, about 15 miles to the S.E. of Lively Island. This is supposing it to be night, or thick weather; if daylight, and the weather clear, the high land in the central chain will be seen, and a course may be steered nearer the coast, passing about 6 or 7 miles outside the East Sea-lion Island, and the same distance from the Shag Rock (which shows high out of the water) and from Lively Island. In either case, after passing Lively Island, a course should be steered towards the Easternmost of the hills; if thick, or too dark to see the hills, a vessel will be in a very good position for waiting for day-

Shag Rock.

light, and should endeavor to keep in about from 40 to 50 fathoms, not standing inshore into less than 30, nor off into more than 60 fathoms. When the land can be made out, by bringing the Eastern hill (Mount Low) to bear North, and keeping it on that bearing, it will lead into the shore, where it can be approached in perfect safety, just outside the entrance to Port Harriet. The Wolf Rock will then be seen; and by passing a mile on either side of it, the Seal Rocks, at the entrance of Port William, will show clear of the extreme Eastern point of Cape Pembroke. If the wind is off the land, a vessel might pass inside the Wolf Rock, but not nearer to it than than three-quarters of a mile, as some rocks run out nearly half a mile to the Westward of it; nor should the kelp near the main shore be approached nearer than a quarter of a mile, as there is a sunken rock at its outer edge, which breaks when there is any swell. *Wolf Rock.*

On the S.E. coast there is so little tide that it need not be considered, though a current will generally be found running with the wind, of from half a knot to one knot; but, after passing Port Harriet, a strong tide begins to be felt. The flood runs to the N.E., past the Wolf Rock, and becomes stronger as it approaches Cape Pembroke, round which it runs from 2 to 3 knots, according to the age of the moon. The flood runs directly to the Northward from the Seal Rocks to Volunteer Point, while very little tide is felt within the heads of Berkeley Sound or Port William. The ebb runs equally strong to the Southward; and when there is a strong breeze, a heavy tide-rip extends 2 miles off shore. With a flood tide it is necessary to guard against being swept too near Cape Pembroke or the Seal Rocks; but if there is a commanding breeze, there is a good passage for the largest ships between the rocks and the cape; with a strong tide and swell, without a good breeze, it is best to pass outside both the Wolf and Seal Rocks. Should a vessel, in doing so, find that she is setting towards the Seal Rocks, the best way then is at once to try and pass between them and the cape, as the tide sets through strongly; but there is a rock to be avoided in this passage, and it is the only danger in the entrance to Port William. It lies in a line with William Islets and the Seal Rocks, and N. by E. ½ E., 4 cables' length from Cape Pembroke; it always shows at half-tide, or when there is much swell, but at high-water it is covered; there is a little kelp close round, and deep water close to it on the East side. Billy Rock is more particularly to be guarded against in leaving Port William to pass round Cape Pembroke with an ebb-tide; for there is no tide felt while running down Port William till near this rock, and then the outside tide being met running strongly to the Southward, it is very likely to sweep a vessel towards the rock, unless allowance is made for it. In passing Cape Pembroke bound to the Southward, the same rule applies as when bound into Port William; that is, if a good breeze, and not much swell, you may run inside the Seal Rocks in safety, the water is deep within a cable's length of the outer rock of Cape Pembroke; but in light winds, or much swell, it is better to pass outside the Seal Rocks, and to keep well to the Northward of them, in order to allow for the tide running to the Southward. *Tides near Port William.* *Billy Rock.*

Directions for entering Port William.—Ships from the Southward should sight Cape Pembroke, which is the Easternmost point of the Falkland Islands, and on which there is a fixed light, 58 feet above the sea. With a commanding breeze anything South of West, keep to seaward of the Wolf Rock, and pass between the Seal Rocks and Cape Pembroke, and then between the Billy Rock and Seal Rocks, where there is plenty of water and no danger that is not visible; having passed the Billy Rock, haul up, and if in doubt, or if the pilot has not come off, anchor abreast of the William Islets; but in daylight there is no danger in standing on to the entrance of Stanley Harbor. The above directions are for Westerly winds, which generally prevail; but when the wind is Easterly, keep outside of the Seal Rocks. *Light.*

Coming from the Northward, with Westerly winds, make Cape Carysfort, or with Easterly winds, Volunteer Point; when they are passed, steer for Cape Pembroke, on which the beacon will be seen, until Port William opens to starboard, when run in and anchor, or wait for a pilot, according to the above directions.

In case of darkness or fog, ships may anchor in the mouth of Berkeley Sound or of Port William, or stand off and on, as may be expedient, there being no danger that is not buoyed by the kelp.

The Wolf Rock bears from Cape Pembroke S. ¼ W., by compass, distant nearly 3 miles. It is of a triangular shape, each side being about 3 cables' length.

The Seal Rocks lie about three-quarters of a mile from Cape Pembroke, and are clean on all sides. The tide runs North and South about 3 knots between Cape Pembroke and the Seal Rocks; the flood sets to the Northward; and the ebb to the Southward.

It is high-water by the shore, at about 5h. 15m. at full and change, and in Ports William and Stanley, about 5h.; the rise and fall being 4 feet at neap, and 7 feet at spring tides, and about the same at all places on the S.E. coast of the East Island. It sometimes rises and falls 8 feet, but very seldom. *Tides.*

Remarks upon the passage round Cape Horn.

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 forward 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 Magellan 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 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, 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 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 experienced off Cape Horn, I do not think it can be considered so unfailing a guide as it is in the lower and 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 of 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

[*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	19	64	58
Haute Isle	45	15.1	65	00
Annapolis Gut	44	41	65	45
Bryer's Island light	44	16	66	22
Cape Fourchu light	43	49	66	07
Seal Island light	43	24	65	58
Cape Sable	43	24	65	36
Shelburne light	43	37.5	65	15
Coffins Island light	44	03	64	36
Cross Island lights	44	20	64	07
Sambro light	44	26.9	63	33.3
HALIFAX, Obs'y. Dock Yard	44	39.4	63	35
Sheet Harbor ent	44	52	62	29
Sherbroke	48	08.5	62	00
White Head Island	45	11.7	61	10
Cape Canso, Cranberry Island light	45	19.8	60	55.7
SABLE I., E. end	43	59	59	46
do W. end	43	57	60	19

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	57.2	59	47.3
Scatari Island light	46	02.2	59	40.6
Flint Island light, N. E. end	46	11.1	59	46.1
SIDNEY, light on Flat Pt	46	16.2	60	07.6
Cape Egmont	46	51.0	60	18.3
Cape North	47	02.6	60	25.2
Island St. Paul, N. extreme	47	13.6	60	08.6
Chetican Point	46	36.4	61	03.2
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., light	45	41.7	61	29.2
Cape St. George	45	51.8	61	55.1
Pictou I., S. side	45	48.4	62	33.5
do light, E. end	45	49.8	62	30.5
Cape Tormentin	46	10.1	63	50
Richibucto River, entrance	46	43.1	64	48.2
Cape Escuminac light	47	04.5	64	47.9
Prince Edward I.				
Prince Edward I., N. cape	47	03.7	63	59.7
do W. point	46	37.2	64	23.6
Red Head	46	26	64	08
St. Peter's Island	46	07	63	12.1
Hillsborough R., ent	46	20.4	62	56.8
Bear Cape	46	00.3	62	27.5
East Cape	46	27.3	61	58.3
Richmond Bay, Royalty Pt	46	33.9	63	42.4
Pt. Miscou, ent. Chaleur Bay	48	01.5	64	32.1
Cape Despair	48	25.4	64	18.8
Cape Gaspé	48	45.0	64	09.8
Cape Rozier	48	51.6	64	12.2
Mt. St. Louis River, E. Pt	49	14.5	65	43.9
Cape Chatte	49	05.9	66	45.6
Anticosti Island.				
I. of Anticosti, E. pt	49	08.3	61	40.3
do Observation Cape	49	38.9	62	41.7
do N. pt	49	57.5	64	09.3
do W. pt	49	52.2	64	32.4
do Ellis' Bay ent	49	47	64	25
do S. W. pt	49	23.8	63	36.1
do S. pt	49	03.6	62	15.8
Magdalen Islands.				
Magdalen Is., N. Bird Rock	47	51	61	09.5
Bryon I., E. pt	47	47.9	61	24.9
East Point	47	37.6	61	23.4
Entry Island	47	17	61	43.2
Amherst Harbor	47	14.4	61	49.7
Deadman's Rock	47	16.1	62	12.6

NEWFOUNDLAND.

Newfoundland.	Lat. D.	Lat. M.	Long. D.	Long. M.
Cape Norman	51	38.0	55	53.7
Green Island	51	24.2	56	34.1
Ferrol Point	51	02.2	57	02.9
Rich Point	50	41.7	57	24.5
Port Saunders, N.E. pt. of ent.	50	38.5	57	18.3
Bay St. Paul's, ent	49	50	57	51
Bon Bay	49	33	58	00
Cape St. Gregory	49	22	58	16
Red Island, S. E. pt	48	33.8	59	13.6
Cod-Roy Island, Boat Harbor	47	52.5	59	24.1
CAPE RAY	47	37.0	59	18.5
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	59	54	16
Cape St. Mary	46	50	54	13
Cape Pine light	46	37.1	53	32.0
CAPE RACE light	46	39.2	53	02.9
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 Light	47	30.5	52	36.8
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 Light	48	42	53	08
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
Groats 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	71	13.3
Coudres I., W. pt. Prairie Bay	47	24.7	70	25.3
Green Island light	48	03.3	69	25.5
Port Neuf church	48	37.3	69	06.3
Bic Island	48	25.1	68	48.8
Bersimis Point	48	53.9	68	38.9
Maniconagon Point	49	06.1	68	12.3
Cape St. Nicholas	49	15.8	67	50.5
Labrador.				
Point des Monts light	49	19.6	67	22.3
Egg Island, W. pt., N. Id	49	38 2	67	10.5
Lobster Bay	49	49.5	67	06
St. Margaret's Point	50	02.4	66	45.1
Point Mosic	50	11.3	66	05.0
Manitoni Point	50	17.6	65	14.5
Mingan Island, summit	50	12.8	64	07.8
Clearwater Point	50	12.5	63	27.4
Appeetetat Bay, E. pt	50	16.6	62	58.4
Nabesippi River, ent	50	13.9	62	13.1
Natashquan River, S. pt. ent.	50	07	61	48
Kegashka Bay, S. end	50	11.3	61	15.7
Cape Whittle	50	10.6	60	07.1
Hare Harbor, E. side	50	36.4	59	17.4
Grand Mecattina Point	50	44.0	59	00.2
Mistanoque Island, N. E. pt.	51	15.8	58	12.4
Lion Island, Isthmus	51	24.0	57	38.7
Greenly Island, N. E. pt	51	23.2	57	10.9
Forteau Point	51	25.5	56	56.7
Loup Bay, Flagstaff	51	31.5	56	49.1
Red Bay, Harbor Island	51	43.8	56	25.7
York Point	51	57.9	55	53.2
Battle Islands, S. E. island	52	15.6	55	32.6
Cape St. Lewis	52	21.3	55	38.7
BELLE ISLE, N. E. point	50	01.1	55	16.4
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. lighthouse, entrance of Machias Bay	44	32.5	67	22
Machias Seal Is., 2 lights	44	29	67	05.5
Petit Manan light	44	22	67	52
Baker's Island light	44	13.5	68	08
Mount Desert Rock light	43	58.5	68	08 5
Isle au Haut	43	59	68	34
Castine	44	22 5	68	45
Matinicus Island light	43	46 5	68	49
Manheigin Island light	43	44 N	69	15 W
Pemmaquid Point light	43	48	69	29
Bantum Ledge	43	42	69	35
Seguin Island light	43	42.4	69	45.2
Brunswick College	43	54.5	69	57.4
Cape Small	43	46.7	69	50.4
Cape Small Point	43	42.1	69	49.9
Cashes Ledge, shoalest part	42	56	68	51.5
PORTLAND, lighthouse	43	37.4	70	12.2
do. City hall	43	39.2	70	15.2
Cape Elizabeth W. light	43	33.8	70	11.8
Agamenticus Hills	43	13.4	70	41.2
Cape Porpoise light	43	21.4	70	25.2
Bald Head Cliff	43	13.2	70	34.4
Cape Neddock	43	10.0	70	35.6
Boon Island light	43	07.3	70	28.3
New Hampshire.				
Whale Back light	43	03.5	70	41.5
New Castle light	43	03.2	70	42.2
Is. of Shoals, White I. light	42	58.0	70	87.1
PORTSMOUTH, Ft. Constitution	43	04.3	70	42.2
Great Boar's Head	42	55.1	70	47.5
Massachusetts.				
Newburyport, E. light	42	48 4	70	48.7
Ipswich, E. light	42	41 1	70	45.6
Squam light	42	39.7	70	40.6
Straitsmouth Harbor light	42	39.7	70	35.0
CAPE ANN, Thatcher's I. S. lt	42	38 2	70	34.2
do Eastern point light	42	34.8	70	39.5
Marblehead light	42	30.3	70	50.5
Baker's Island, lights	42	32.2	70	46.8
SALEM, city hall	42	31 5	70	53.9
BOSTON, lighthouse	42	19 6	70	53.1
do State house	42	21.5	71	03.5
Scituate light	42	12.3	70	42.6
Plymouth lights, Gurnet S. Lt	42	00.2	70	35.7
Billingsgate light	41	51.6	70	03.9
Race Point light	42	03 7	70	14.3
CAPE COD Highland Lt	42	02.4	70	03.3
Long Point light	42	02.0	70	09.8
Chatham Harbor, S. light	41	40.2	69	56.6
Nauset Centre light	41	51.6	69	56.7
Monomoy Point light	41	33.5	69	59.3
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, Great Point light	41	23 4	70	02.4
do Brant Point light	41	17.4	70	05.2
do Sankaty Head Lt	41	17 0	69	57.6
Nantucket South Shoal* old	41	04	69	51
Cape Poge light (Vineyard)	41	25.2	70	26.7
Holmes' Hole, W. Chop light	41	29	70	36.7
Nobsque Point light	41	30.9	70	39.0
Tarpaulin Cove light	41	28.1	70	45.1
Cuttyhunk light	41	24 8	70	56.7
Gay Head light	41	20 9	70	49.8
No Man's Land	41	15.2	70	48.5
New Bedford, Baptist Ch	41	38.2	70	55.3
Clark's Point light	41	35.5	70	53.7
Dumpling Rock light	41	32.2	70	55.6
Gooseberry Neck	41	29.3	71	02.0
Rhode Island.				
Seaconnet Point	41	26.5	71	13.5
NEWPORT, spire	41	29.2	71	18.5
Beaver Tail light	41	26.9	71	23.6
Goat Island light	41	29 6	71	19.3

*New, 40 37.03 69 31.04

	Lat. D.	Lat. M. N	Long. D.	Long. M. W
Dutch Island light	41	29.8	71	23.9
Warwick light	41	40.0	71	22.4
Nayat Point light	41	43.5	71	20.0
Providence Baptist Church	41	49.6	71	24.2
Point Judith light	41	21.6	71	28.9
Block Island, lights	41	13 4	71	34.2
do S. E. point	41	08	71	34
Watch Hill light	41	18.2	71	51.2
Gull Island light	41	12.3	72	06.1
New York and Connecticut.				
Montauk Point light	41	04.2	71	51.1
Fire Island light	40	37.9	73	12.8
Cedar I. light, (Sag Harbor)	41	02 4	72	15.3
New London light	41	19.0	72	05.1
Plum Island light	41	10.4	72	12.4
Saybrook Point light	41	16.2	72	20.3
Faulkner's Island light	41	12 7	72	38.9
NEW HAVEN, Yale College	41	18.5	72	55.4
do light	41	14.9	72	53.9
Stratford Point light	41	09.1	73	05.9
Black Rock light	41	08 5	73	12.7
Norwalk Island	41	02 8	73	25.6
Old Field light	40	58 6	73	06.8
Eaton's Neck light	40	57.2	73	23.4
NEW YORK, City hall	40	42.7	74	00.1
Sandy Hook light	40	27.7	73	59.8
N. Jersey and Pennsylvania.				
Navesink, lights	40	23.7	73	58.8
Barnegat light	39	46.0	74	06.0
Great Egg Harbor entrance	39	19	74	35
Cape May light	38	55.8	74	57.3
Cape Henlopen light	38	46.6	75	04.7
Egg Island light	39	10.5	75	08.0
PHILADELPHIA, State house	39	56.9	75	08.7
Maryland and Virginia.				
Smith's Island light	37	07.8	75	52.2
Cape Charles	37	07.3	75	57.9
Cape Henry light	36	55.5	76	00.2
Norfolk City Hall	36	50.8	76	47.0
Old Point Comfort light	37	00.0	76	18.1
Yorktown	37	13	76	34
Petersburg Court house	37	13.8	77	24.0
Richmond Capitol	37	3.-2	77	25.8
WASHINGTON CITY, Capitol	38	53.3	77	00.2
Baltimore, Wash. Monument	39	17.8	76	36.6
Annapolis, Md. State house	38	58.7	76	29.2
North Carolina.				
Wimble Shoals (centre)	35	35	75	22
Cape Hatteras light	35	15.2	75	30.6
Deep soundings off do	35	06		
Ocracoke light	35	06 5	75	58.5
Cape Lookout light	34	37.3	76	30.7
Deep soundings off do	34	28		
Old Topsail Inlet	34	41	76	40
Beaufort Court house	34	43.1	76	39.5
Wilmington Custom house	34	14.0	77	56.8
Brunswick	34	02	77	58
Smithville	33	54	78	01
New Inlet Federal Pt. Lt	33	58	77	55
Cape Fear Bald Head Lt	33	52.3	77	59.8
Deep soundings off do	33	35		
South Carolina.				
GEORGETOWN Church	33	22.1	79	12.5
Georgetown lighthouse	33	18.4	79	06.7
Cape Roman	33	01	79	17
CHARLESTON, Fort Pinckney	32	46.4	79	54.4
Charleston lighthouse	32	41.9	79	52.5
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	01.4	80	50.5
SAVANNAH Exchange	32	04.9	81	05.3
St. Catherine's Sound, (Bar)	31	41	81	07
Sapello Bar	31	31	81	12
Sapello light, S. pt. I.	31	21	81	18
Doboy Bar	31	19	81	14
St. Simon's light, S. pt. I	31	07	81	26
Brunswick	31	06	81	31
Cumberland Island light	30	56	81	26
S. pt. Cumberland Island	30	43	81	28
Amelia Island light	30	40.5	81	26.5
East Coast of Florida.				
Amelia Island, S. pt	30	30	81	26
River St. John's light	30	20.5	81	24
St. Augustine, lighthouse	29	52.2	81	19
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	39.9	80	09.4
Carysfort Light	25	13.3	80	12.7
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, light	24	33.0	81	48.1
Sand Key, light	24	27.2	81	52.7
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	36.7	82	54
West Coast of Florida.				
Key Vacas	24	42	81	05
Key Axi	24	57	81	07
Cape Sable	25	06.5	81	09
Cape Roman	25	51	81	56
Entrance Bay Carlos	26	33	82	12
Tampa Bay, entrance	27	35	82	48
Anclote Keys	28	14	82	54
St. Mark's, lighthouse	30	04.4	84	10.6
Dog Island light	29	46.5	84	40
Cape St. George	29	34	85	02
Cape St. Blas	29	37.5	85	20.5
St. Joseph's Bay, entrance	29	51.6	85	23
St. Andrew's Island, N. W. point	30	03	85	37.7
St. Rosa's Bay, entrance	30	27	86	31
PENSACOLA, Town	30	25	87	11.5
Pensacola, Light	30	19	87	16.9
Mobile Point, light	30	13.8	88	00.5

	Lat.		Long.	
	D.	M. N	D.	M. W
Mobile Bartons Academy	30	41.4	88	01.9
Mobile	30	41.8	87	59.0
Massacre Island, W. point	30	12.0	88	22
Ship Island, West	30	12.9	88	57.0
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 Poutre	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	00.5
Barrataria	29	17½	89	57
Bayou La Fourche	29	06	90	10
Timbalier Island, (Tonbalier,) N. W. point	29	05	90	23
Racoon point	29	03	90	57
Bayou Descartes, entrance	29	10	91	04
Point au Fer light	29	19½	91	20.2
Rabbit Island	29	29	91	36
Sabine River, entrance	29	40.6	93	49
Galveztown entrance	29	20.5	94	45.0

Islands in the West Indies.

Windward Islands.	Lat.		Long	
Trinidad—	D.	M. N	D.	M. W
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 N. point	14	06	60	57
——— S. point	13	41	60	54
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.		Long.	
	D.	M.	D	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. L. 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 Light	18	28	69	52.5
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 Ft. Alexander	18	33	72	16.8
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. Ft. St. Levy	19	49.5	73	19.1
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	59	71	10.5
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.	Lat. M.	Long. D.	Long. 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	06
Entrance Cumberland Harbor	19	54	75	05
St. Jago de Cuba, Light	19	58	75	52
Tarquin's Peak	20	13	76	51
Cape Cruz	19	47	77	45
Manzanilla	20	20	77	20
Key Breton	21	05	79	28
Trinidad River	21	43	80	00
Bay Xagua Lt.	22	02	80	28
Piedras Key	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	31	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	58.5	78	51.3
Great Isaac	26	02	79	06.3
Bemini Island, Southern	25	44.3	79	20
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	77	04

	Lat. D.	Lat. M.	Long. D.	Long. 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
Double-Headed Shot Key, light	23	56.4	80	27.6
Salt Key	23	42	80	24
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.	Lat. M.	Long. D.	Long. M.
Galveston Inlet	29	17 N	94	45 W
W. P. Galveston Island	29	04	95	26
Rio Brazos	28	58	95	33
Pasa del Caballo	28	24	96	18
Aranzas Inlet	27	49	97	04
Corpus Christi	27	36.5	97	16
Brazo de Santiago	26	06	97	12
Rio Bravo del Norte	25	56	97	12
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	22
Tamiagua City	21	16	97	29
River Tuspan, entrance	20	58	97	18
Point Piedras	20	45.5	97	12
River Cazones	20	42	97	12
Tenestequepe	20	40	97	9
Boca da Lima	20	33.5	97	04
River Toculata, entrance	20	27	97	00
Mount Gordo	20	16	97	01
River Nauta, entrance	20	13	96	47
River Palmas, entrance	20	10	96	45
Point Piedras	20	00	96	35
River de Santa Nos	19	55	96	30
Point Delgada	19	49	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 Zampoa	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	09
St. John de Ulloa	19	12½	96	08
Xamapa	19	04	95	58
River Medelin, entrance	19	06	96	04
Point Anton Lizardo	19	04	95	58
Bar de Alvarado	18	46	95	45
Tlacotalpan	18	35	95	36

South Coast of the Gulf of Mexico.	Lat. D.	Lat. M.	Long. D.	Long. M.
Vigia	18	38 N	95	18 W
Point Roca Partida	18	43	95	11
Point Morillos	18	40	94	54
Pic de San Martin	18	30	95	10
Point Olapa	18	34	94	50
Point Misappe	18	21	94	38
Barilla	18	11	94	35
Bar Guazacoalcos	18	11	94	22
River Tonata	18	18	93	59
River St. Ann	18	20	93	49
River Cupilco	18	26	93	26
Dos Bocas	18	26	93	06
River Chittepeque	18	24	93	02
River Tabasco	18	34	92	40
River St. Peter and Paul	18	38	92	32
Island Carmen, Wt. P.	18	38	91	51
Yucatan.				
Point Escondido	18	58	91	15
Javinal	19	10	90	58
Point Morros	19	45	90	43
CAMPECHE	19	49	90	33
Point Desconocida	20	46	90	26
Point Gorda	21	06	90	13
Point Piedras	21	09	90	07
Yxil	21	20	89	24
St. Clara	21	22	89	02
Bocas de Silan	21	24	88	56
El Cuyo	21	30	87	43
Island Jolvas, N. P.	21	30	87	11
Island Contoy, N. P.	21	36	86	52
Arcas Island	20	12	91	59
North Bishop	20	30.5	92	13
S. W. Triangle	20	55	92	15
New Shoal	20	33	91	50
Island Arenas	22	07	91	25
Baxo Nuevo	21	50.2	92	04.7
Sisal Fort	21	10.1	90	02
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	
Utilla, 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 Alla, N. W. P.	15	09		82	27	
Seranilla, N. E. Breaker	15	45		79	41	
Seranilla, 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	30½		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	
Coro	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	

	Lat. D.	Lat. M.		Long. D.	Long. M.	
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	39	
——— 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 Tugioca	0	32		47	58	
Para	1	28		48	29	
Bay Maracuno	0	33		47	41	
Caite Harbor	0	46		47	06	

	Lat. D.	Lat. M.	Long. D.	Long. M.
ape Gurapi	0	39 s	45	56 w
hoal off do	0	36	45	56
. Point of Island of St. Joao	1	19	44	50
igia, fell in with by M. du Sylvia, officer of the Brazilian Marine, in 1824 or 1825	0	32	44	17
igia of Manuel-Luis, Westerly Rock	0	51	44	15
ondrain Itacolomi	2	09	44	25
t. Allegre (the summit)	2	17	44	20
lcantara (west church)	2	24	44	23
ock E. of Isle Medo	2	30	44	19
ity of San Luis de Maranham (cathedral)	2	31	44	16
ort Sant Antonio das Areias, the flag staff	2	29	44	17
ort San Marcos	2	28	44	16
le Maranham, (white sand hills, north part)	2	25	44	04
reakers of Coroa Grande, the north one	2	10	43	58
orthwest one	2	13	44	04
Vest	2	17	44	05
le St. Anne, N. E. point	2	15	43	38
reakers of Isle St. Anne, E. point	2	13	43	30
orro Alegre	2	20	43	13
ancoes Grande, E. point	2	26	43	00
iver Perguicas, E. point	2	41	42	27
iver Tutoya, entrance	2	41	42	12
iver Tapuyu, entrance	2	50	40	50
t. Tapuyu, W. summit	2	58	40	51
t. Ticondiba, summit	3	11	40	37
oint de Jericacoara, the highest sand hill	2	47	40	27
nd Hill, near the shore	2	50	40	39
ount Memoca	3	18	40	06
ernando Noronha	3	55	32	24
occas. (dangerous)	3	51	33	49
ernambuquinho	3	02	39	37
orro Melancia	3	12	39	20
and hill of Parati	3	24	38	59
ountains of Ciara, 1st	3	58	38	41
d. summit	3	53	38	46
d. do	3	50	38	43
h. do	3	46	38	49
h. do	3	39	38	48
ara, steeple in the city	3	43	38	34
oint Macoripe	3	42	38	31
orro Aracati, summit	4	42	39	55
oint Reteiro Grande	4	36	37	33
eteiro Pequeno, remarkable sand hill	4	48	37	19
orro Tibao	4	49	37	18
oint de Mel	4	55	36	59
oint du Tubarro	5	02	36	28
reaker) das Urcas	4	52	36	19
o.) de la Lavandela	4	55	36	20
oint Calcanhar, summit	5	08	35	31
oint Petetinga, low	5	22	35	20
Brazil.				
APE ST. ROQUE	5	28	35	17
ort of Rio Grande	5	45	35	15
oint Negra, Mountain	5	53	35	12
oint Pipa, sand mount	6	13	35	04
hia Fermosa, S. point	6	23	35	00
hia da Traicao, N. point	6	41	34	57
hurch of St. Theresa	6	57	34	53
ort Cabedello	6	58	34	50
aranahyba de Norte	7	06	34	53
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, largest	20	29	28	54
Trinidad Island, S. E. Pt.	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.		Long.			Lat.		Long.	
	D.	M.	D.	M.		D.	M.	D.	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				
——— C. Gloucester.....	54	30	73	02	point.....	52	27	58	54
——— Cape Pillars, S. W. en-					Beauchêne Island.....	52	51	59	12
trance to Magellan's straits,	52	43	74	38	Cape Meredith, S. W. point				
Evangelist I., W. entrance to					Falkland Islands.....	52	16	60	39
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 12th, 1831.

August, 1857.—The positions of the Coast of the United States are those of the Coast Survey, A. D. Bache, Superintendent.

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.

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Extract of a letter from Lieut. John Rodgers, commanding U. S. Ship "Hancock," attached to the Surveying Expedition to the China Seas, North Pacific.

NEW BEDFORD, January 4th 1852.

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