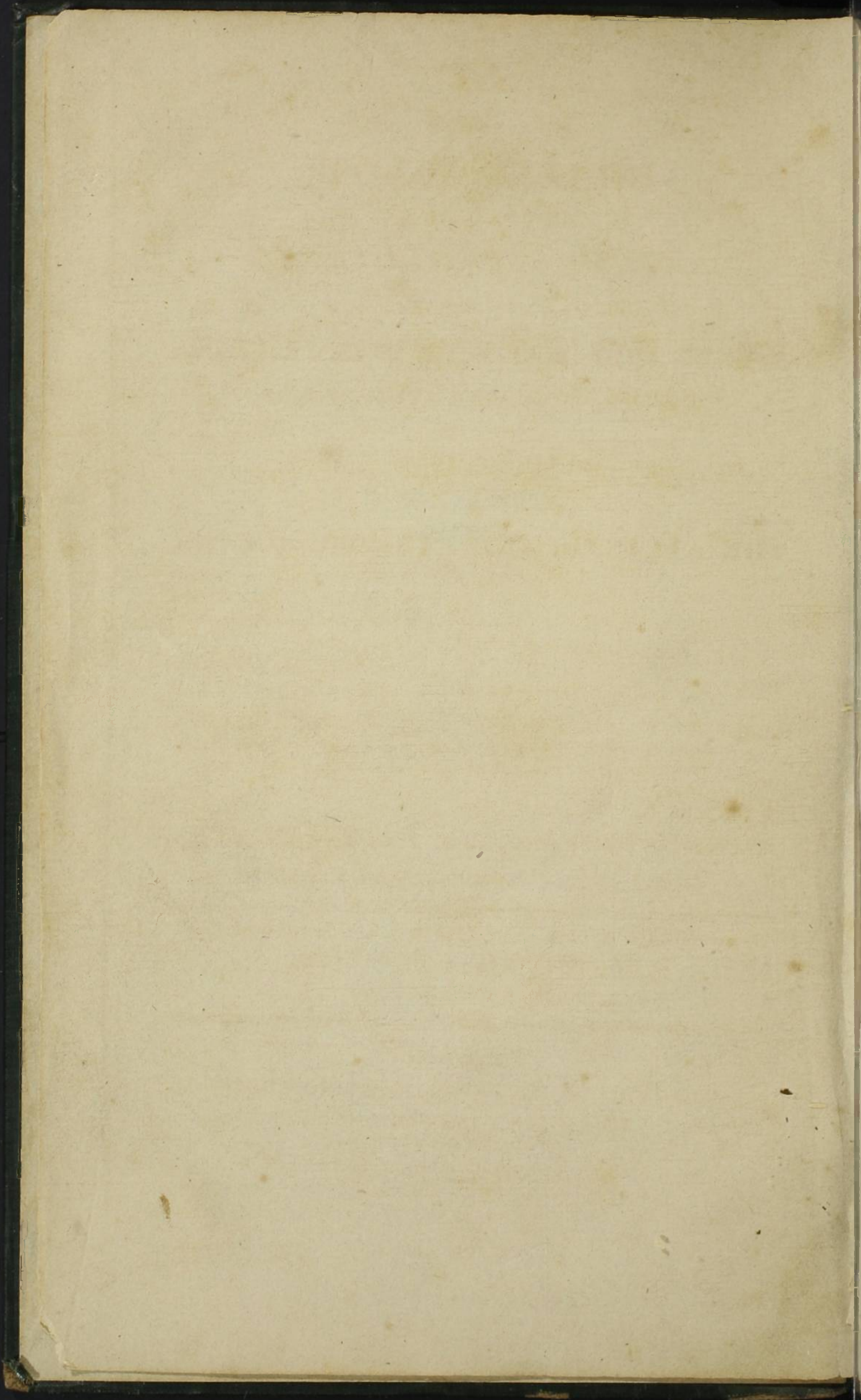


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THE
BRAZIL PILOT;
OR,
SAILING DIRECTIONS
FOR THE
Coast and Harbours of Brazil,
BY MESSRS. WARNER AND HARRIS, MASTERS, R.N.;
INCLUDING
AN ACCOUNT OF THE PREVAILING WINDS
IN
THE ATLANTIC AND ETHIOPIC OCEANS,
WITH
DIRECTIONS
For NAVIGATING from the ENGLISH CHANNEL,
TO THE
COAST OF BRAZIL, CAPE OF GOOD HOPE, ST. HELENA,
THE MADEIRA, CANARY, CAPE VERDE, AND
AZORE OR WESTERN ISLANDS;
ALSO, PARTICULAR
DIRECTIONS FOR THE RIVER PLATE,
BY CAPT. PETER HEYWOOD, OF H.M.S. NEREUS.

COMPILED, TO ACCOMPANY THE CORRESPONDING CHARTS PUBLISHED HEREWITH, BY

JOSEPH FOSS DESSIOU,

Master, of the Royal Navy.

LONDON:

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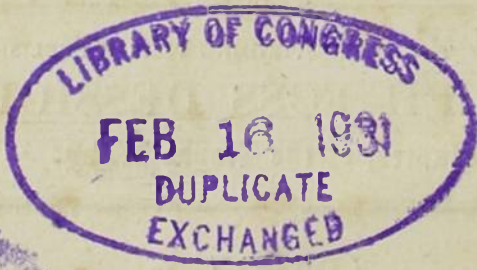
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Chart of the River Plate from Monte Video to Buenos Ayres, Surveyed by John Warner, Master of H.M.S. Nereus, Peter Heywood, Esq. Captain, shewing the Tracks of that ship in the years 1810, 11, 12, 13, and 14. August 12, 1817 0 7 6

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CONTENTS.

| | PAGE. |
|--|-------|
| Of the prevailing Winds in the Atlantic and Ethiopic Oceans | 1 |
| Directions for Sailing from the British Channel towards Porto Santo, Madeira, &c. | 4 |
| The Island of Porto Santo..... | ib. |
| The Island of Madeira..... | 5 |
| Directions for Sailing from Madeira towards the Equator | 8 |
| The Salvages | ib. |
| The Canary Islands, viz. | 9 |
| Palma and Teneriffe | ib. |
| Gomera and Ferro..... | 11 |
| Canaria and Fortaventura | 12 |
| Lanzarote | 15 |
| Graciosa | 14 |
| Directions for Sailing among the Canary Islands..... | 15 |
| Of the Passage from the English Channel to the Canary and Cape Verde Islands..... | 17 |
| The Cape Verde Islands, viz..... | 18 |
| Ilha de Sal, or Salt Island, and Bonavista | 19 |
| Leton's Rock, or Reef..... | 21 |
| Mayo, or Isle of May, and St. Iago | 22 |
| Del Fuego, or Fogo | 24 |
| Brava and St. Nicolas | 25 |
| St. Lucia and St. Vincent | 26 |
| St. Antonio..... | 27 |
| Directions for Sailing from the Cape Verde Islands across the Equator..... | ib. |
| St. Paul's Island, and Fernand de Noronha..... | 30 |
| The Roccas | 31 |
| Coast of Brazil.—From Cape St. Roque to Maranham..... | ib. |
| Directions for Sailing to St. Luis of Maranham..... | 35 |
| from Maranham to Belem, or Para..... | ib. |
| Cape St. Roque to Cape Frio | 38 |
| Rio Grande and Itamaraca | ib. |
| Pernambuco Harbour | 39 |

Dup. ext. Lib. of Cong. 17 Mch 1931

| | PAGE. |
|--|-------|
| Directions for Sailing from Bahia, or St. Salvador | 41 |
| Os Ilheos and Porto Seguro | 43 |
| Espirito Santo | 44 |
| Cape Frio to Cape St. Mary | 45 |
| Rio Janeiro | ib. |
| Ilha Grande and St. Sebastian | 48 |
| Santos Bay..... | 49 |
| Garopas Bay and Island St. Catherine | 50 |
| Remarks on the Winds, Weather, Currents, &c. in the River Plate, with In- structions for Navigating therein, by Capt. Peter Heywood, R.N..... | 52 |
| Directions for Sailing from the Coast of Brazil to the Cape of Good Hope .. | 64 |
| Islands in the Ethiopic Ocean | 65 |
| Ascension Island | ib. |
| St. Helena Island | 66 |
| Martin Vas Rocks and Trinidad Island | 68 |
| Ascensao, or False Trinidad, and Saxemburg Island..... | 70 |
| Tristan d'Acunha Islands..... | 71 |
| Gough's Island | 72 |
| Directions for Sailing from the Equator to the Cape of Good Hope, and also to St. Helena | 73 |
| Cape of Good Hope and Bays in its Vicinity, with Directions | 74 |
| Table Bay | ib. |
| Dassen, or Coney Island | 76 |
| False Bay | 77 |
| Directions for Sailing from the Cape of Good Hope towards the English Channel | 80 |
| The Azores, or Western Islands..... | 82 |
| Island of St. Michael | ib. |
| Island of St. Mary..... | 86 |
| The Hormigas, or Ants | 88 |
| Island of Terceira..... | 89 |
| St. George..... | 92 |
| Graciosa | 94 |
| Pico | 96 |
| Fayal | 98 |
| Flores..... | 102 |
| Corvo..... | 105 |
| Directions for the Entrance of the English Channel | 106 |

APPENDIX

CHAPTER I
OF THE HISTORY OF THE
CITY OF BOSTON

The first landing of the English in North America was in 1492, when Christopher Columbus discovered the continent. The first permanent English settlement was founded in 1607 at Jamestown, Virginia. The Pilgrims arrived in 1620 on the Mayflower and established the Plymouth colony. The Massachusetts Bay Company was chartered in 1630, and the first settlement was founded at Boston in 1630. The city grew rapidly and became a center of trade and industry. The American Revolution broke out in 1775, and Boston was the scene of many important events, including the Battle of the Clouds and the Siege of Fort Mifflin. The city was occupied by British troops from 1774 to 1780. After the war, Boston became a center of the American Industrial Revolution. The city has a rich history and is one of the most important cities in the United States.

APPENDIX.

DIRECTIONS for NAVIGATING in the NORTHERN CHANNEL of the RIO DE LA PLATA, or RIVER PLATE, from MONTE VIDEO, to the ROAD of BUENOS AYRES, and into the BAY of COLONIA.

By John Cragg, Master, and Henry Foster, Midshipman, of H. M. S. Creole, to accompany their Survey, made by order of Commodore William Bowles, 1819.

N. B.—The bearings and courses are all magnetic, the variation of the Compass being about 15° East.

VESSELS intending to go up this Channel should not draw more than 12 feet of water; for although the soundings which are laid down in the Chart, indicate a sufficient depth for Vessels of a greater draught, yet, in places between the Bay of Pavon and Colonia, where we have had 3 fathoms, we have at other times found only 13 feet.

On leaving *Monte Video* for *Buenos Ayres*, steer so as to keep the *Mount* bearing N.E. by E. until *Point Espinilla*, which forms the eastern point of entrance into the River St. Lucia, bears N. $\frac{1}{2}$ E. you will then be to the southward and westward of the *Panela*, a sunken bed of Rocks, having only 5 feet water on them, and 4 fathoms with soft muddy bottom close to them: they lie with the *Mount* bearing E.N.E. the Cathedral N. 75° E., and *Point Espinilla*, North, and are about 5 miles distant from the nearest shore. There is a passage between these rocks and the shore, by keeping the *Mount* bearing E. by N., which will take you in mid-channel in from 3 $\frac{1}{2}$ to 4 $\frac{1}{4}$ fathoms water, between them and a Sand-bank which has only 2 fathoms on it. This Sand-bank extends from Primera Baranca S.S.E. $\frac{3}{4}$ E. about 5 miles, the *Mount* bearing from its South extremity N. 85° E., and *Point Espinilla* N. 45° E. but as this passage can only be recommended with a fair wind, it can be but of little importance.

Being outside and past the *Panela Rocks*, you may shape a W.N.W. course, which will take you about 4 miles to the south westward of *Point Santa Maria*, in from 4 $\frac{1}{4}$ to 3 fathoms water, soft muddy bottom, but, (as Captain Heywood very correctly observes, that no stated course can be steered in consequence of the irregular set and rate of the tides or currents) it is to be understood that great attention must be paid to the Ground Log, and allowance made for those irregularities, in shaping the different courses herein given. *Point Santa Maria* is

easily to be distinguished, from its being the western extremity of the high land, which is bold to, called, the Ravines of St. Gregory and St. Lucia, and there being also a few sand hills immediately to the westward of it. This remarkable point ought always to be made by vessels, as it will insure their not being drifted between the Banks of Ortiz, but it should not be approached nearer than 4 miles, in order to avoid a sand-bank that extends about 3 miles in a S.W. by W. direction from it, and then trends to the northward and westward into the bay along the coast, on which there are only 2 fathoms.

Having *Point Santa Maria* bearing E.N.E. distant about 4 miles, you may haul up N.W. by W. for the River Cufre, (about 4 miles to the eastward of which is a remarkable table sand-hill,) taking care not to shut in *Point Santa Maria* with a prominent sandy Point to the westward of it, off which there is (at present, 1819) the wreck of a vessel, as by so doing you would immediately shoal your water, off the bay of Pavon, from $2\frac{1}{2}$ fathoms soft mud, to 7 feet hard sand.

There are only two clumps of Trees to be seen when in shore to the westward of *Point Santa Maria*, excepting a few at the entrance of the River Cufre: the first or easternmost clump is about half way between *Point Santa Maria* and *Pavon*; the second or westernmost clump is at the entrance of Pavon River, from whence to the westward the general character of the coast, is sandy, interspersed with patches of green brush-wood, &c.

When abreast of *Pavon*, bearing N.E. by N. distant between 4 and 5 miles, in the depth of 3 fathoms, soft muddy bottom, you may steer for Colonia W. $\frac{1}{2}$ S. in from 3 to $2\frac{1}{2}$ fathoms, keeping at the distance of 3 or 4 miles off shore, and when in sight of the steeples be careful in not bringing them to bear any thing to the southward of W. $\frac{1}{2}$ S. in order to avoid the *Skerries*, a bed of rocks, one of which is above water, lying with the steeples of Colonia bearing S. $77^{\circ} 30'$ W. distant about $10\frac{1}{2}$ miles, and at about 2 miles from the nearest shore, having $2\frac{1}{2}$ fathoms water close to them.

Being past these rocks and in sight of the Island of Farallon bearing W. by S. steer for it in that direction, until the steeples of Colonia bear N.W. $\frac{1}{2}$ N. when, keeping them on that bearing, you must haul across the river, (between the N.W. tail of the Ortiz bank, which bears from Colonia S. 74° E. distant $16\frac{1}{2}$ miles, and having on it $2\frac{1}{4}$ fathoms water, dark brown sandy bottom, and the Fishers bank, the north end of which lies with Colonia steeples in one bearing N. 11° W. and the *Island of Farallon* S. 85° W. having on it 2 fathoms, hard brown sand,) until the Island of Farallon bears W. by N. when you may shape a W. by S. course, taking into consideration the wind and set of the tide, for the outer Road of *Buenos Ayres*.

Or if going into Colonia, when you have passed the *Skerries*, continue steering towards the *Island of Farallon* W. by S. until a red roofed house, which is the westernmost building, and situated near the middle of the bay, bears north, when you must steer for it, in order

to avoid a reef of rocks extending from the *Island St. Gabriel* half way across towards Colonia, and anchor with the steeples bearing E. by S. and the centre of the *Island St. Gabriel* S. W. in 18 feet water, on soft muddy bottom.

If having a westerly wind and intending to work up this channel from *Monte Video*, do not bring the *Mount* to bear to the eastward of N. E. by E. $\frac{1}{2}$ E. until you are past the *Panela* rocks; and when abreast of *Point Santa Maria*, take care not to approach it nearer than 4 miles, in order to avoid the sand bank that lies off it; and, if standing over towards the *Banks of Ortiz*, to go about, when the bottom becomes stiff clay from soft mud, which is the general nature of soundings in the fair channel.

When standing towards the shore to the westward of *Point Santa Maria*, be careful that you do not shut it in with a prominent sandy point to the westward of it; and when in sight of the steeples of *Colonia*, never bring them to bear to the southward of W. $\frac{1}{2}$ S. in order to avoid the *Skerries*.

Being past the *Skerries* and bound to *Colonia*, when working between the *Main*, which is steep to, and the *Fisher's Bank*, be careful and never bring the *Island of Farallon* to the westward of W. $\frac{3}{4}$ S, as the water shoals suddenly from 5 to 2 fathoms on the *Fisher's Bank*. But you may stand off across the river, between the N.W. tail of the *Ortiz* and the *Fisher's Bank*, where, having more sea room, you may bring the steeples of *Colonia* to bear N.N.E. and then steer for them, in $3\frac{1}{2}$, 4, $3\frac{3}{4}$, 3, $2\frac{1}{2}$, and 4, fathoms, until the red roofed house bears north, when you may run in and anchor with the bearings before given.

THE END.

SOUTH AMERICAN NAVIGATION.

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DIRECTIONS
FOR SAILING FROM THE
BRITISH CHANNEL,
TOWARDS THE
COAST OF BRAZIL,
Cape of Good Hope, &c.

The bearings and courses throughout are according to the true north, or pole of the world, unless where otherwise expressed.

Of the prevailing Winds in the Atlantic and Ethiopic Oceans.

AS a general knowledge of the prevailing winds through the extent of those seas which he has to pass over, is of the greatest importance to the navigator, it is thought necessary here to treat of the winds most commonly met with, as well in the Atlantic as in the Southern or Ethiopic ocean.

In the European seas, and so far as the 28th and sometimes the 20th degree of north latitude, the winds are variable, and blow sometimes from one quarter, sometimes from another, without appearing to be subject to any rule, at any season of the year. The same shifting of the wind prevails in the southern hemisphere beyond the 28th degree.

From the 28th degree of north latitude to the equator, those regular winds, commonly called trade-winds, blow constantly from N.N.E. to east, excepting in the neighbourhood of coasts and islands, and in other places from particular causes.

On the coast of Africa, from Cape Blanco so far as Sierra Leon, the winds, excepting land-breezes and storms, blow more frequently from north to north-west, than from north to the eastward. From Sierra Leon to Cape Palmas, the ordinary course of the wind is from W.N.W. and beyond Cape Palmas, from W.S.W. to S.W.

Although the Canary islands are situated within the limits of the

trade-winds, and northerly or N.E. winds mostly prevail among them, yet westerly and S.W. winds sometimes prevail there, and have blown eight days without intermission. Between the Cape Verde islands, and in their vicinity, southerly and S.W. winds generally blow in July, August, September, and October; and during these months it is not considered safe to lie in the roads of those islands.

The equatorial limits of the trade-wind between the meridians of 18° and 26° of west longitude, have been found, upon the comparison of more than 350 journals, English and French, to vary considerably, even in the same months of the year, as will appear in the following table.

Table shewing the equinoctial limits of the N.E. and S.E. trade-winds, between the meridians of 18° and 26° west longitude.

| MONTHS. | N.E. TRADE-WIND. | | S.E. TRADE-WIND. | | Mean breadth of interval between the N.E. & S.E. trades. |
|-----------------|-------------------------------|-------------------------|--------------------------------------|-------------------------|--|
| | General extremes of latitude. | Probable mean. | General extremes of latitude. | Probable mean. | |
| January | 3° to 10° N. | $5\frac{1}{2}^\circ$ N. | $0\frac{1}{2}^\circ$ to 4° N. | $2\frac{1}{2}^\circ$ N. | 3° |
| February | 2 to 10 | $5\frac{1}{2}$ | 1 S. to 3 | $1\frac{1}{2}$ | 4 |
| March | 2 to 8 | 5 | 1 to $2\frac{1}{2}$ | $1\frac{1}{4}$ | $3\frac{3}{4}$ |
| April | 3 to 9 | $5\frac{1}{2}$ | $0\frac{1}{2}$ to $2\frac{1}{2}$ | $1\frac{1}{2}$ | 4 |
| May | $4\frac{1}{2}$ to 10 | $6\frac{1}{2}$ | 0 to 4 | $2\frac{1}{2}$ | 4 |
| June | 7 to 13 | 9 | 0 to 5 | 3 | 6 |
| July | 8 to 15 | 11 | 1 N. to 6 | $3\frac{1}{2}$ | $7\frac{1}{2}$ |
| August | 11 to 15 | 13 | 1 to 5 | $3\frac{1}{4}$ | $9\frac{3}{4}$ |
| September | 9 to 14 | $11\frac{1}{2}$ | 1 to 5 | 3 | $8\frac{1}{2}$ |
| October | $7\frac{1}{2}$ to 14 | 10 | 1 to 5 | 3 | 7 |
| November | 6 to 11 | 8 | 2 to 5 | 3 | 5 |
| December | 3 to 7 | 5 | 1 to $4\frac{1}{2}$ | $2\frac{3}{4}$ | $2\frac{1}{4}$ |

In this table the columns of extremes exhibit the uncertain termination of the trade-winds, as experienced in different ships. The columns of *probable mean* differ a little from the exact mean of the two extremes for each month, and incline from the true mean, towards that extreme experienced by the majority of the ships; and the last column shows the mean breadth of the interval between the N.E. and S.E. winds; but the columns of general extremes will be found most useful, as it points out the situations where the trades may reasonably be expected to commence or fail.

In the space of variable winds between the trades, exhibited in the last column, it has been found, that southerly winds are most prevalent; more particularly when the sun has great northern declination. Homeward bound ships from the East Indies are therefore enabled, at this season, to cross the space more speedily than those outward bound; which they do, in some degree, at all other times.

The space from the 25th to the 28th, or 29th degree of north latitude, between the variable and trade-winds, is remarkable for a continual change of winds, with sudden gusts and calms, rain, lightning, and thunder: to the northward of these latitudes, westerly winds generally prevail nine months in the year.

Between the equator and the tropic of Capricorn a constant trade-wind prevails between the south and east; and as the same winds are prevailing nearly over the whole extent of the seas southward of the line, they are named *general winds*, in order to distinguish them from the north-easterly trade-winds, which in some particular seas are subject to periodical variation.

When the sun is at its greatest declination, north of the equator, the S.E. winds, particularly between Africa and Brazil, will vary half a point or more to the southward, and the N.E. trade-wind as much to the eastward. The contrary happens when the sun is near the southern tropic; for then the S.E. wind, south of the line, veers more to the eastward, and the N.E. wind in the Atlantic veers more to the northward.

The extent of the general winds is not limited at the equator; they are met with so far as the 5th or 6th degree of north latitude, or farther, according to the season of the year. Sometimes the N.E. and S.E. trade-winds extend very near each other, and at other times there will be an interval of several degrees between them, subject to calms, sudden gusts, thunder, lightning, and heavy rains.

All along the coast of Africa, from the 28th degree of south latitude to Cape Lopo Gonsalvez, near the line, the winds blow almost constantly from south to S.S.W. and in some places S.W.; and this tendency of the winds from south to S.W. extends to a great distance from the coast of Africa: in general, it appears to be bounded by an imaginary line, drawn from the Cape of Good Hope to Cape Palmas on the coast of Guinea.

Near the coast of Brazil, the general winds are subject to periodical shiftings. From September to March, they blow from N. E. to E.N.E.; and from March to September, from S.S.E. to E.S.E. In the usual track of ships from the Line to the Cape of Good Hope, beyond the parallel of 16 degrees, the S.E. trade-wind veers to the eastward and northward, so that it blows oftener from east to N.E. than from east to S.E.

Although the limits of the S.E. trade-wind are generally considered to be at the 28th degree of latitude, yet there are exceptions to this rule, for different winds are often met to the northward of this parallel, and sometimes even within the tropic of Capricorn. From the 28th to the 40th degree of south latitude, the winds are generally variable, and more inconstant than in the European seas; for they are scarcely at any season found to blow three days the same way: but the most prevalent are from north to N.W. and thence to W.S.W. when they get round to the southward, a calm succeeds.

About the Cape of Good Hope, the winds from S.E. to E.S.E. sometimes blow for many days together without changing.

Near the coast of Brazil, from Cape St. Augustin southward, the wind blows nine months of 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 river Plate, it becomes a regular land breeze from evening till morning, and throughout the day the reverse. During the three

stormy months, that is March, April, and May, the wind is generally southerly, blowing very fresh and squally at times from the south-west.

A strong current sets southward from Cape St. Augustin, from the middle of October until January; after which there is no particular current until the middle of April, at which time a powerful one sets northerly until July, and then subsides in like manner.

For a more particular account of the prevailing winds on the coast of Brazil the reader is referred to the Chart of that coast, which this book is written to accompany, whereon are several tracks of his majesty's ship *Nereus*, at different seasons, with the winds that were daily experienced, together with the height of the mercury in the thermometer, as it stood at 8 o'clock each morning.

DIRECTIONS for sailing from the BRITISH CHANNEL towards PORTO SANTO, MADEIRA, &c.

Ships bound from England across the Equator, should, so soon as they are clear of the Channel, steer such a course as to pass Cape Finisterre at the distance of 50 or 60 leagues; because, if the wind should then incline to the westward, they will be enabled to continue their course to the southward along by the coast of Portugal. Nevertheless, if necessary, this Cape may be passed very near, or at any intermediate distance; but from its latitude, if the wind be fair, a course should be shaped for Porto Santo. Although the making that island may not be considered indispensably necessary, it is, however, very proper to get a sight of it, or Madeira, that they may proceed on their course with more certainty, whether it is intended to pass between the Canary Islands or to the westward of them.

PORTO SANTO* is very remarkable, and may be seen, in clear weather, 15 or 20 leagues off. It first appears in two or three very high hummocks, by which it is distinguished from Madeira and the little islands named the *Desertas*. The town of Porto Santo is situate on the S.W. side of the island in 23° 3' north latitude, and 16° 27' west longitude from the meridian of Greenwich: the road is before the town, and is described in some respects to be better than that of Funchal. Here water and refreshments may be obtained.

To the northward of Porto Santo is a ledge of rocks, the position of which was ascertained by the officers of his majesty's sloop *Falcon*, Lieut. J. Bowen, in January, 1802. The least depth upon them, according to the observations then made, is 4½ fathoms. They are steep-to, and lie at the distance of 8 miles from the northernmost point of the island, with the N.E. point bearing by compass S.S.E.; the Ilheo da Fonte, or northernmost rock, S. by W.; and the west point of the island S.S.W.

This ledge or bank extends east and west, nearly a mile and a half, terminating in a reef to the westward: the shoalest part, supposed

* See the Survey of Porto Santo, by Lieut. Colonel Roberts, and Capt. T. Wolley, R.N. published by W. Faden.

to be a pinnacle rock, lies as above, or nearly so, the boat in which the bearings were taken being agitated by the sea. There can be little doubt that this is the reef, formerly said to lie 3 leagues north-eastward from Porto Santo, on which a Dutch ship was lost.

A bank of rocks, on which the least depth is 40 fathoms, lies about 3 miles to the E.S.E. of the Ilheo de Serra, the south-eastern islet of Porto Santo.

A bank of rocks, named the Eight Stones, 5 leagues in extent from north to south, and 3 leagues from east to west, was seen by Capt. Vobonne, of London, in 1732, who counted 8 rocks even with the surface of the water. He placed the northernmost of them in $34^{\circ} 45'$, and the southernmost in $34^{\circ} 30'$ north latitude; and adds, that the southernmost lies 40 leagues N. 5° E. from the east end of Madeira. If the position assigned this bank by Capt. Vobonne is correct, it should bear N. by W. 23 leagues from the northernmost point of Porto Santo.

All ships bound to Madeira from Europe, should endeavour first to make the island of Porto Santo, and proceed thence to the road of Funchal.

The little isles, called the *Desertas*, on which there are a few fishermen's huts, are long and narrow: and lie almost in a N.N.W. and S.S.E. direction. Their northern end is about 11 or 12 leagues S.S.W. from Porto Santo. When they bear W. by N. about ten leagues distant, they appear separately; the northernmost long, high, and nearly even: the southernmost, called the *Bogio*, in two hummocks, nearly as high, and about two thirds the length of the former. At the distance of 6 or 7 leagues, a small island off the northern extreme becomes discernable, like a low wall: close to this is a high rock, frequently mistaken for a ship under sail.

The ISLAND OF MADEIRA* is about 12 leagues in length E. by S. and W. by N. and about 3 leagues in breadth. Its principal town, *Funchal*, is on the south side, about one third down from the east end towards the west end. The latitude of the town is $32^{\circ} 37' 40''$ N. and longitude $17^{\circ} 5'$ W. from Greenwich. Point de S. Lorenzo, the east point of the island, is in $32^{\circ} 43' 20''$ N. and longitude $16^{\circ} 50'$ W.; and Punta del Pargo, the west point, is in $32^{\circ} 49'$ north lat. and $17^{\circ} 33'$ west longitude.

The passage between the two *Desertas* is clear, though bounded on each side by breakers, or rather by surf; but it should not be attempted unless from necessity, as it is very narrow, and has no soundings, or at least very deep water in it; and a ship is subject to be becalmed in it by the northern *Deserta*, which overlaps the *Bogio*. This happened to a vessel of about 200 tons, which came through it in the night, having mistaken it for the broad passage to the northward.

Between the *Desertas* and Madeira is a clear passage, eight miles broad, having no soundings, except at 50 or 60 fathoms, almost close over on the Madeira side. In the season of the breezes, (the N.E.

* See the Survey of Madeira and Porto Santo, published by W. Faden.

winds which prevail in summer,) a strong current sets through this passage to the south-westward.

The island of Madeira is very high, excepting the eastern end, which is a low rugged point; yet it is often so entirely clouded over as not to be visible at the distance of 5 leagues. But when abreast of Porto Santo, it commonly appears like a great mountain, with its summit hidden in the clouds: on a nearer approach the Desertas appear. Having passed those islands, the ships in the road of Funchal will soon be perceived; and, from their riding, it will be seen how the wind is in the road, as it is common to have a strong breeze from N.E. or E. when passing the Desertas, and at the same time the wind in the road is from the S.W. or W.S.W.

When sailing in towards Funchal-road, a large rock, named the Leeuw or Loo rock, with a fort on it, will be seen on the west side of the road, a little to the westward of the town. This rock should be brought to bear N. by E. or N. by E. $\frac{1}{2}$ E. by compass, and when in 38 or 36 fathoms let go the larboard anchor, with two cables on it; for should there be a fresh breeze from the eastward, it will be scarcely possible to bring up with one cable. A kedge anchor with a hawser is necessary to be laid out to the westward, from the starboard bow, to keep the ship steady, as the wind generally veers from the eastward to S.W. and west: when the land breeze reaches them, the hawser end may be shifted. Ships generally ride with a whole cable, that they be able to cut near the splice, should circumstances unfortunately compel them to put to sea without weighing their anchor: a slip buoy should always be kept on the cable.

The best anchorage is in from 28 to 32 fathoms, on sandy ground, with the citadel, (called also the *Peak Castle*, a brown square fort on a hill over the west part of the town,) a little open to the eastward of the Loo rock; the latter at the distance of half a mile. The anchorage appears equally good, with the Loo-rock and Peak-castle in one, bearing about N. by E. by compass, in 30 to 35 fathoms, stiff ground. To the westward of this the ground changes to sand and rock, and to the eastward stiff clay, but deep water; and near the edge of the bank, which on this side is very steep, foul rocky ground.

Off the valley of Funchal there are regular land and sea breezes, particularly during the summer; the sea breeze sets in from the south-westward sometime in the forenoon; the land breeze comes off shore about ten o'clock at night, sometimes later, even to 2 or 3 o'clock in the morning. These breezes do not extend above 3 or 4 miles from shore; but, when it blows fresh in the offing, there is generally a counter breeze in the stream of the valley of Funchal; unless it blows hard, then the true wind prevails also in the road.

There is generally a surf on the beach, early in the year particularly, which prevents landing in a ship's boat any where, except within (to the north-westward of) the Loo-rock, about half a mile from the town; therefore the boats of the place are employed for goods, watering, &c. Spring tides rise and fall about $7\frac{1}{2}$ feet, and on full and change days it is high water at $\frac{1}{2}$ past 10 o'clock: the

flood stream runs to the eastward. The current along the south side of the island seems to be always governed by the true wind in the offing. The rainy season is in January, February, and March; October, November, and December, are also frequently wet months.

The road is open from the west to E.S.E. but the winds blow strongest here when from S.W. to S.E. Ships obliged to anchor here in winter must be guarded against the consequence of a dark gloomy appearance of the atmosphere to the southward, with a swell setting in, and put to sea immediately; for should it blow strong from the southward, it would be almost impossible to clear the shore; the anchorage being so near the land; therefore it is very dangerous to remain at anchor with those prognostics.

Squalls sometimes come fresh off the land; there is one instance of a hurricane down the valley of Funchal blowing every ship out of the road, which was so violent, that the ships were hid from the town by the spray of the sea, although in a clear sun-shining day.

The best way for ships, however large or numerous, when bound into Funchal-road from the eastward with a north-easterly wind, is through the passage between Madeira and the Desertas: the north-easter will carry them abreast of the Brazen-head, the east point of the bay of Funchal. In the night a single ship may keep near that bluff point, and, with her boats towing a head, when becalmed, get into the stream of the land-wind, and then fetch the anchorage. Ships must shew a light at their ensign staff in the night, to prevent being fired at from the Forts and Loo-castle. In the day they should keep farther distant from the land than in the night, to prevent being becalmed under it, and to gain the stream of the sea breeze. If, from over-caution, or other reasons, they fall 2 or 3 leagues to leeward of the road, they should then keep plying up in the stream of the valley, until they gain the vein of the sea breeze, observing to make short tacks opposite the valley, as here both the land and sea-breezes are most regular.

When running into the road with a fresh breeze, sail should be reduced in time, that the ship's way through the water may be diminished at the time of anchoring; and it is best to bring up with the head to seaward, in order to be ready, in case of any accident in bringing up, to make sail off shore, or otherwise, as necessary.

Small vessels from North America and the Western Islands come in, generally, round the west end of the island, but are frequently becalmed a considerable time under the high land there. For this reason, ships, on leaving Funchal, should make sail with the land breeze, and stand directly off from the road. Ships bound to the southward, by taking a contrary method, have continued several days becalmed under the western part of the island.

The regulations of the port of Funchal require all ships, before or immediately on anchoring, to acquaint the governor of the island what they are, and their reasons for stopping there. Ships of war are not to send their boats to vessels coming into the road, until they are visited by the Pratique-boat, a boat manned by persons appointed to enquire if any infectious disorder is on board. The same is to be

observed respecting vessels that are departing, which are not to be boarded after the visiting officer has been to search for natives attempting to leave the island clandestinely, and for prohibited goods. English ships of war salute with 13 guns after an assurance of an equal return.

It is necessary to be cautious of the shore boats, which come off to the ship to sell fish, fruits, and vegetables, as their chief object is often the sale of the worst spirituous liquors to the seamen, and sometimes concealed goods. Fresh beef, water, and vegetables, are to be procured here for the ship's company, and are sent on board in boats belonging to the place.

DIRECTIONS for sailing from MADEIRA towards the EQUATOR; including the CANARY and CAPE VERDE ISLANDS.

Departing from Madeira, or after passing to the westward of it, the track most advisable is to the westward of the *Canary* and *Cape Verde* islands, at any discretionary distance, or barely in sight of them. By adopting this *route*, they will not only avoid the light winds and calms, which frequently prevail among these islands, as well as several dangers in their vicinity, but may reasonably expect a steadier breeze. Although there are instances of ships, after passing in sight of the Canaries to the westward, having the wind from that quarter, which obliged them to pass to the eastward of the Cape Verde islands.

During the winter months, those who are not desirous of stopping in Funchal road, should endeavour to pass to the westward of Madeira also, at any convenient distance, exceeding 6 or 7 leagues; because strong westerly gales prevail in November, December, and January, which produce severe squalls and eddy winds near the island on the east side.

If a ship be bound to Teneriffe, or intend to pass between the Canaries, care is requisite to avoid the Salvages, which must not be approached in the night.

The SALVAGES consist of a larger island, named *Ilha Grande*, or the Great Salvage, an islet named the Great Piton, and a smaller one named the Little Piton, together with a number of rocks. The Great Salvage lies in latitude $30^{\circ} 10' N.$ and longitude $15^{\circ} 55'$ west: it is about a league in circumference, and may be seen from the distance of 8 or 9 leagues: about a mile from its northern side lie several rocks, which may be always seen from the distance of 3 or 4 leagues. The Great Piton which lies in latitude $30^{\circ} 2' N.$ and longitude $16^{\circ} 5' 20''$ in some respects resembles the largest Needle-rock at the west end of the Isle of Wight, and at a great distance looks like a sail: a ridge of sunken rocks extends from it to north-eastward. Its south side appears very green, but its north side is barren: it may be seen 5 or 6 leagues off. The Little Piton is very flat, bears S. by W. from the greater one, and appears to be connected with it by a ledge of rocks. Navigators unacquainted with these

isles should not approach them, excepting on the eastern side of the Great Island, which is clear, and has anchorage to the S.E.

THE CANARY ISLANDS

Are eleven in number, extending from latitude $29^{\circ} 20'$ to $27^{\circ} 40'$ N. and from longitude $13^{\circ} 28'$ to $18^{\circ} 10'$ W. Four of them are small; the others are mostly high with steep rocky shores: the landing is often impracticable, and there is not one good harbour for large ships.

PALMA, the north-westernmost of these islands, is 8 leagues in length north and south, and about $5\frac{1}{2}$ leagues broad in the widest part; and is frequently seen by the outward bound to the Coast of Brazil or Cape of Good Hope. Its summit is high with a bold coast, hence some navigators run towards it with great confidence in the night; but several ships have nearly been lost thereon in dark nights, the lights on the mountains first shewing their dangerous situation. The chief port is that of *Santa Cruz*, on the east side of the island, situated in latitude $23^{\circ} 43'$ N. longitude $17^{\circ} 46'$ W. The mark by which it may be found is the following: on approaching the east side of the island, Palma will appear shaped like a saddle. Steer so as to fall in a little to windward of the lowest place, or middle of the saddle, until you are within a mile of the land; then, running along shore to the southward, the town will be seen close by the sea shore, and the shipping lying in the road; but as the land behind the town is high and steep, the shipping cannot be discerned until within a mile of them. The road is within a musket shot of the shore, where vessels generally ride in 15 to 20 fathoms water, exposed to easterly winds, but the ground being clean and good, ships with good anchors and cables may ride safely in all winds: for the great elevation of the island, with the perpendicular height of the land facing the road, repels the wind that blows upon it, though ever so strong. And although in the winter season the great swell that comes into the bay from the north-east breaks high upon the beach, and prevents communication with the shore for 3 or 4 days together, yet the depth of water, and want of wind, deprive it of strength or power, so that ships in such a case ride without straining their cables.

Santa Cruz de la Palma is a large town, but not so good or large as that of Palmas in Canary, or the towns of Teneriffe. It has a mole, and near the mole a castle, or battery, mounted with a few cannon, for the defence of the shipping. Tassacorta, the port next in consideration is on the S.W. part of the island: it is exposed to westerly winds, and little frequented by any vessels excepting boats; it is in latitude $23^{\circ} 38'$ N. long. $17^{\circ} 58'$ W. This island is said to be more subject to the westerly winds and rains than any of the others.

TENERIFFE is nearly 16 leagues in length nearly N.E. and S.W. and at its S.W. end about 6 leagues broad. Near the centre of the island is the famous peak, called, by the ancient and present inhabitants, the *Peak of Teyde*: it is elevated about 12,300 feet above the

level of the sea, and may be seen from the distance of about 45 leagues when the atmosphere is clear.

Santa Cruz in the island of Teneriffe is the best roadstead in the Canary islands, and is the port generally used by ships which stop at these islands to procure refreshments: it is situated on the east side of the island in latitude $28^{\circ} 28' 30''$ N. and longitude $16^{\circ} 16'$ W.

At a short distance from Point Naga, the N.E. point of Teneriffe, are some high perpendicular rocks; and 4 or 5 leagues thence, on the S.E. side of the island, is the bay or harbour of *Santa Cruz*; and, although it is but an indifferent roadstead, it is, as before said, the best in the Canaries. The best anchoring place for merchant ships is, between the middle of the town and a fort or castle about a mile to the northward of it. In all that space ships anchor from a cable's length distance from the shore, in 6, 7, or 8 fathoms water, to half a mile in 25 or 30 fathoms. Ships of war anchor at about half a mile off the northernmost fort, with their outer anchor in 30 to 36 fathoms, and their inner one in 15 or 18 fathoms. The bottom being foul in many parts of the road, it is necessary for ships which remain any time to buoy their cables from the ground. This road is exposed to N.E. east, and S.E. winds, but ships with good anchors and cables generally ride securely, as it is not above once in the space of four or five years that they blow so hard as to cause any considerable damage. Capt. Geo. Vancouver anchored here in 1791, and, in the relation of his voyage, has stated, "We had the mortification, this morning, May 1st, of finding the small bower cable cut through nearly in the middle, which seems to have been occasioned by an anchor lying at the bottom. The loss of an anchor, where no other could be procured, was a matter of serious concern; no pains were spared to regain it until the afternoon of the fifth, when all our exertions proved ineffectual; and being apprehensive that other lost anchors might be in its vicinity, we weighed, went farther out, and again anchored in 30 fathoms, on a soft, dark, oozy, bottom, intermixed with small white shells, having the northernmost church steeple in a line with the centre of the jetty, bearing by compass N. 48° W. and the southernmost fort S. 71° W. about three quarters of a mile from the town. This anchorage appeared to be so far preferable to our former situation, being nearly as convenient to the landing place, without the hazard of damaging the cables which small vessels might have lost nearer in shore; and which is the only danger to be apprehended here, as the bottom is good holding ground, and, to all appearance, perfectly free from rocks."

Santa Cruz is an excellent place for procuring a supply of cheap wines, which are of a weak quality: vegetables, and the fruits common in Europe, are plentiful; but poultry, and all kinds of live-stock, are very indifferent, and most extravagantly dear. Good water is easily procured when the surf is not high on the beach.

Oratava. The next best port to *Santa Cruz* is that of *Oratava*, situated on the north-west side of the island, at about $8\frac{1}{2}$ leagues to the south-westward of Point Naga. It is a tolerably good harbour in the summer season, or from the beginning of May to the end of

October; but, in winter, ships are frequently compelled to slip their cables and put to sea, lest they should be surprised by a N.W. wind, which throws in a heavy sea; luckily these winds seldom happen; and, in general, give warning, so that a vessel has time to get away. The anchorage is in 50 fathoms, at about a mile and a half from shore, with the peak bearing about S.W. It is commonly calm in the road, but there is almost always a long northerly swell, that causes ships to roll heavily; and the sea breaks furiously on the rocks, with which the shore is skirted.

The latitude of Oratava is $28^{\circ} 25' N.$ longitude $16^{\circ} 35' W.$ and the peak is situated in latitude $28^{\circ} 17' N.$ and longitude $16^{\circ} 40' W.$ On full and change days it is high water throughout the Canary islands at about 3 o'clock: spring tides rise from 8 to 10 feet.

GOMERA. The middle of this island lies S.W. 5 leagues from Point Teno, of Teneriffe. *St. Sebastian*, the principal town, is situated close by the sea shore in the bottom of a bay, on the east side of the island, where shipping lie land-locked from all but the S.E. winds. Here they may anchor at a convenient distance from the shore, in from 7 to 15 fathoms; but as the land wind frequently blows hard, it is necessary to moor with a long scope of cable towards the shore, lest you should be blown out of the bay. The sea here is generally so smooth, that boats may land on the beach without danger. On the north side of the bay is a cove, where ships of any burthen may haul close to the shore, which is a high perpendicular cliff, and there heave down, clean, or repair. When the surf runs high at the beach so that boats cannot land, they generally put ashore at this cove, whence there is a path-way along the face of the cliff to the town.

The town has plenty of good water, which is drawn from wells in every part of it; and, in the winter, a large rivulet from the mountains empties itself into the port. On the south side of the mouth of this rivulet stands an old round tower; and on the top of its perpendicular cliff, on the north side of the cove, is a chapel, and a battery, with a few pieces of cannon for the defence of the port. The latitude of the port is $28^{\circ} 5' 40'' N.$ longitude $17^{\circ} 8' W.$

To the best of my remembrance, says Capt. Glas, the land that forms the north point of the bay is the most southerly point of land on the east side of Gomera, that can be seen from Point Teno, on Teneriffe. That land, when one is to the northward of it, at about a league distant, bears great resemblance to Rame-head, near Plymouth Sound. In going into the bay, it is necessary to stand close in with this point, for the land-wind is generally too scanty for a ship to fetch the proper anchoring place; from that reason it is better to come in with the sea breeze, which generally begins to blow here about noon. The best place for a ship to lie in here is, where a full view may be had through the main street of the town, and at about the distance of a cable's length from the beach: it is necessary to moor so soon as possible, because of eddy winds that sometimes blow in the bay.

FERRO.—This island is the south-westernmost of the Canaries, is about 14 miles in length, and has neither road nor harbour worthy

of particular description. It has one church, but the town is inconsiderable. The land rises steeply from the sea, and is craggy on all sides for about a league, so as to render the ascent very difficult. The position of the town of Valverde is latitude $27^{\circ} 47' 20''$ N. and longitude $17^{\circ} 57'$ W.; and of La Dabessa, or western point, latitude $27^{\circ} 44'$ N. and longitude $18^{\circ} 10'$ W.

CANARIA, or *Grand Canary*. The Isleta, or N.E. point of Canaria, is in latitude $28^{\circ} 13'$ N. and longitude $15^{\circ} 25'$ W. P^{ta}. Arguinequi, the south point, is in latitude $27^{\circ} 45'$ N. and longitude $15^{\circ} 38' 30''$ W.; and P^{ta}. Aldea, the west point, is in latitude $28^{\circ} 1' 20''$ N. and longitude $15^{\circ} 31'$ W. This island is 29 miles in length from north to south, and 26 miles broad: its centre is exceedingly high, and full of lofty mountains, which tower so far above the clouds as to stop the current of the N.E. wind that generally prevails here; so that, when this wind blows hard on the north-east side of the mountains, it is either quite calm on the other side, or a gentle breeze blows upon it from the S.W.

On the north-east end of Canaria is the peninsula, called the Isleta, 2 or 3 leagues in circumference, connected to the island by an isthmus, about 2 miles long, and one quarter of a mile broad at the narrowest part. On each side of this isthmus is a bay; that on the N. W. side being exposed to the swell of the sea, is therefore an unfit road for shipping; but small vessels get in between a ledge of rocks and the shore, and lie there smooth and secure from all winds and weather. Here the natives repair their small vessels.

On the other side of the isthmus is a spacious sandy bay, called, by some, *Puerto de Luz*, and by others, *Puerto de las Isletas*, from some steep rocks or islets at the entrance of the bay, towards the N. E. This is a good road for shipping of any burthen, with all winds, excepting from S.E. to which it is exposed; but that wind, which is not common here, seldom blows so hard as to endanger a ship. The landing place is at the bottom of the bay, where the water is so smooth, that a boat may lie broadside to the shore without danger. *Palmas*, the capital of the island, lies about a league hence to the S.W.; and shipping that discharge there, generally anchor, in good weather, within half a mile of the town, for the quicker dispatch; but that place is not a good roadstead.

The next port, of any consequence, is named *Gando*, situated near the middle of the east side of the island. It is a good situation for shipping, with all winds, excepting from the southward; and there, good water, with other refreshments, may be had.

FORTAVENTURA. This island is the next to the eastward of Grand Canary, and Point Handia, its S.W. point, lies 16 leagues E. by S. from the Isleta; and in clear weather, either of these islands may be seen from the other: it is nearly 19 leagues in length N. E. and S.W. and 5 leagues broad at its widest part. Point Handia is situated in latitude $28^{\circ} 4'$ N. and longitude $14^{\circ} 31' 30''$ W.; and the Isle of Lobos, near the N.E. point of Fortaventura, is in latitude $28^{\circ} 45'$ N. and longitude $13^{\circ} 49'$ W. The little island, Lobos, or Seal's Island, is about a league and a half in circumference; it is uninhabited and

destitute of water. There is a good road for shipping, about half-way between it and Fortaventura, or rather nearer the latter, with the east point of Lobos bearing N.E. by N. or N.E. Although this road appears to be open and exposed, yet it is very safe with the trade-wind, for the water is smooth, and the ground every where clean, being a fine sandy bottom. Directly ashore from the road, on Fortaventura, is a well of good water, of easy access.

LANZAROTE is the easternmost of the Canary islands, is very high, and may be discerned at a great distance. On approaching it appears black, rocky, and barren. It is 10 leagues in length N.E. and S.W. and about $3\frac{1}{2}$ in breadth, and has three good harbours; the principal of which is *Porto de Naos* on the S.E. side, in latitude $28^{\circ} 58' 30''$ N. longitude $13^{\circ} 33'$ W. Any vessel not drawing more than 18 feet may enter it at high water, spring tides, and lie secure from all winds and weather; although in sailing along the coast the shipping appear as if at anchor in an open road, the harbour being formed by a ridge of rocks not perceivable at any distance, as most of them are under water: these break off the swell of the sea, so that the inside is as smooth as a mill-pond. As there is no other convenient place in the Canaries for cleaning and repairing large vessels, it is much frequented for that purpose, by the shipping trading to the islands. At the west end of the harbour stands a square castle, built of stone, and mounted with some cannon, but of no great strength, for ships of war may approach within musket shot of it. There is no town, but some magazines are erected, where corn is deposited in order to be ready for exportation. The entrances into the harbour, between the reefs, are very narrow.

Puerto de Cavallos, or El Recife, is another port, on the west side of the castle. This is an excellent harbour also, and formed like the former by a ridge of rocks; but its entrance is shallow, there being no more than 12 feet water in it, with spring tides. The castle above mentioned is built upon a small island, between the two harbours, and so defends them both: this island is connected with the land by a bridge, under which boats go from one port to the other; or from Puerto de Cavallos to Puerto de Naos.

At the north end of Lanzarote is a spacious harbour, named *El Rio*, which is the strait or channel dividing this island from the uninhabited one called *Graciosa*. A ship of any burthen may pass through this strait: for, if she keeps in the mid-way, she will have 6 or 7 fathoms water all along.

If a smooth place to ride in, while the trade wind blows, be required, a ship coming in from the eastward must run a good way in, and double a shallow point which lies on the starboard hand, taking care to give it a good berth, by approaching it no nearer than into the depth of 4 fathoms; when past it, edge towards *Graciosa*, and anchor in any convenient depth; for it shoalens gradually towards the shore, close to which there are 2 fathoms.

This is a commodious place, in the summer season, for careening large ships; for a man of war, of any nation, at war with Spain, may come here and unload all her stores, &c. on the Isle of *Graciosa*, and

heel and scrub. Or, if two vessels happen to come in together, one may heave down by the other; in doing which, they need not fear any opposition from the inhabitants, there being neither castle nor habitation near this port.

The water, however, is not so smooth here as in Puerto de Naos, especially if the trade-wind happens to blow hard from the east, which sends in a swell that makes it troublesome, if not impossible, to careen a ship properly. But the wind here very seldom blows from that quarter: the prevailing winds being from N. to N.N.E. In mooring here it is necessary to have a good anchor, with a large scope of cable, towards Lanzarote; because, with E. or S.E. winds, heavy gusts or squalls come from the high land of that island. In winter, the wind sometimes shifts to the S.W.; then it is necessary to weigh, and run back to the eastward, round the shallow point before mentioned, until the ship is sheltered from that wind, and there anchor.

That part of Lanzarote, facing the harbour or channel of El Rio, is a high steep cliff, from the bottom of which, to the shore, is about two musket-shot's distance. The ground, in this space, is low; and here is a salina, or salt-work. From the shore, the only way of access into Lanzarote, is by climbing a narrow, steep, and intricate, path-way, that leads to the top of the cliff, which it is scarce possible for a stranger to ascend without a guide.

The island of GRACIOSA, before mentioned, which lies on the north side of the channel El Rio, is about 3 miles in length and 2 in breadth: it is destitute of water. The little isle of *Allegranza* lies to the northward of this, at the distance of 6 or 7 miles, in latitude $29^{\circ} 25' 30''$ N. and longitude $13^{\circ} 31'$ W. About 8 miles to the eastward of *Allegranza* and *Graciosa* is a large high rock, called *Roca del Este*, or the East-rock: on the west of those islands is another of nearly the same size, called *Roca de Owest*, or the West-rock. S.W. about 3 leagues from *Graciosa*, lies a rocky, uninhabited, island, named *Santa Clara*. Many ships have been wrecked upon these islands in the night, being misled by errors in their reckoning, and also by these islands being improperly laid down in some charts, which place them nearly 30 miles farther south than they ought to be.

La Bocayna. Through the broad channel between Lanzarote and Fortaventura, named *La Bocayna*, ships sail very safely, as it is deep in the middle, and shoalens gradually towards Lanzarote, near to which are 5 fathoms water; but very near, or close to *Lobos*, the ground is foul and rocky. In this passage, vessels of any burthen may find room enough to ply to windward, without approaching near to *Lobos*. When a vessel comes from the eastward with the trade-wind, and is passing through *La Bocayna*, so soon as she brings a high hill on Lanzarote to bear directly to windward of her, she will be becalmed, and soon have the wind at S.W. When this happens, make short tacks, until you get into the trade-wind again, or a northerly wind, the first puff of which will come from the west, or W.N.W. So soon as this is perceived, stand to the southward, for if you stand to the northward, you will lose it again; and the nearer you approach the more favourable you will have the wind, so that before you are

two-thirds over, you will meet with a steady wind at north or N.N.E.

When there is a great westerly swell hereabouts, the sea breaks horribly on the rocks at the N.W. end of Lobos. Captain Glas affirms, that he has seen breakers there near 60 feet high; of which, were one to strike the strongest ship, she would be staved to pieces in a moment. "When I first saw," says Captain Glas, "those mighty breakers, our ship had just passed through the channel, between Fortaventura and Lobos; we had a fine brisk trade-wind at N.N.E.; and although there were no less than 10 fathoms water, when we came into the westerly swell, yet we trembled lest the waves should have broken, and thought ourselves happy when we got out of soundings. We heard the noise of these breakers, like distant thunder, after we were past them 6 or 7 leagues."

*DIRECTIONS for SAILING among the CANARY ISLANDS,
by Captain Glas.*

If a ship, lying at Palma, wants to go to Lanzarote, and will not wait for a fair wind, (which, indeed, seldom blows there, especially in the summer season,) let her stand over to the N.W. side of Teneriffe, and beat up along shore until she weathers Point Naga; thence, with the wind that generally prevails in these parts, she will be able to weather Canaria, and fetch the Point of Handia, or Fortaventura, or perhaps Morro Gable, (the southern point) whence it is easy to beat up to Pozzonegro, along the east side of the island, because the sea there is always smooth. It is not quite so easy to beat up from Pozzonegro to the Isle of Lobos, yet it may be done, without difficulty, when the weather is moderate: if the wind should happen to blow hard, she may stop in the bay of Las Playas, until it proves more favourable.

From the Isle of Lobos she will find no difficulty in beating up to Porto de Naos, in Lanzarote. It is not advisable for those who are not perfectly well acquainted with that harbour to attempt to conduct a ship in, because the entrances are very narrow.

It is common for ships which come loaded from Europe to Santa Cruz, Teneriffe, &c. to have part of their cargoes to unload at Port Orotava; these ships, when the trade-wind blows hard, will sometimes find it impracticable to weather Point Naga: when this is the case, bear away to the leeward point of the island, and keep near the shore, where, if you do not meet with a southerly wind, you will be carried by the current, in the space of 24 hours, from the S.W. point of the island to Point Teno, whence you may easily beat up to Port Orotava: for, when the wind blows excessively strong at Point Naga, it is moderate weather all the way until within 2 or 3 leagues of Point Naga. But I would not advise a ship to bear away as above directed, unless when the trade-wind blows so fresh that she cannot weather Point Naga; because, in moderate weather, there is little or no wind stirring on the coast between Teno and Port Orotava.

The coast of Africa, east of the Canaries, is level, and is rendered inaccessible by a heavy surf which breaks on it continually. The

Canarians, in the sea between this coast and the islands, employ a number of barks to fish for bream and cod.

Of the Calms of the Canary Islands, by the same.

It has been already noticed, in the description of the Island of Canaria, "That its mountains tower so far above the clouds, as to stop the current of the north-east wind that generally blows here; so that, when this wind blows hard on the north side of the mountains, it is either quite calm on the other side, or a gentle breeze blows upon it from the S.W." These calms and eddy winds, occasioned by the height of the mountains above the atmosphere, extend 20 or 25 leagues beyond them to the S.W. There are calms beyond, or to leeward, of some of the rest of the islands, as well as Canaria; for, those of Teneriffe extend 15 leagues over the ocean, the calms of Gomera 10, and those of Palma 30. "I have," says Captain Glas, "been frequently in all the calms of the islands, excepting those of Palma; and, from my experience of them, I may venture to say, that it is extremely dangerous for small vessels, or open boats, to venture within them, when the wind blows hard without. It is true, indeed, the wind raises the waves of the sea to a mountainous height; yet these waves follow each other in regular succession; for, were they to fall confusedly one against another, no ship would be able to sail on the ocean. But, in a storm, the wind driving the sea before it, each wave gives place to the one which follows; whereas, in the calms of the Canary islands, the sea not moving forward in the same direction with the sea without, but being as it were stagnant, or at rest, resists the waves that fall in upon it from without; and this resistance causes them to break just in the same manner as the billows break upon the sea shore, but with less violence, on account of the different nature of the resistance. This breaking of the waves is only on the verge of, or just entering into, the calms: for within them the water is smooth and pleasant.

Upon first coming into the calms, the waves may be seen foaming and boiling like a pot, and breaking in all directions. When a vessel comes amongst them, she is shaken and beaten by the waves on all sides, in such a manner, that one would imagine she could not withstand their force; however, this confusion does not last long. The best way to manage a ship entering the calms is, immediately to haul up the courses, and diligently attend the braces, to catch every puff of wind that offers, in order to impel the ship into them as soon as possible. The crew must not think it strange to be obliged to brace about the yards every two or three minutes, according as the wind veers and hauls; but, after a ship is once fairly into the calms, she will either find a dead calm and smooth water, or a pleasant and constant breeze at south, or S.W. according as the wind blows without, to which this eddy wind, as it may be called, always blows in an opposite direction."

Of the Passage from the ENGLISH CHANNEL to the CANARY and CAPE VERDE ISLANDS, by M. D'Apres de Manneville.

M. D'Apres de Manneville in his directions for navigating from the English Channel to the East Indies, says, "In the passage from the Coasts of France to the Canaries you may frequently find differences in your reckoning to the eastward, which arise most probably from the indraught of the currents towards the Strait of Gibraltar. Some have made the land on the *Coast of Africa* when they expected to have discovered *Teneriffe*. Others have gained sight of *Allegranza*, off the northern part of Lanzarote, instead of *Teneriffe*; and, though the errors in reckoning may not frequently be so considerable, yet it is safer to be on your guard, when you judge, by your reckoning, that you are in the latitude of these islands, especially in the night time, or when the want of moon-light, or very thick hazy weather, prevents you from discovering dangers at such a distance as to be able to escape them.

"The differences to westward, though much more rare, are yet not without example; chiefly when the winds have been contrary for some time after the departure from the ports of England or France.

"The best course for vessels bound from the Canaries to the Island of St. Iago, is to stand on to the southward to about 25 or 30 leagues to the eastward of the Isle of Bonavista; and, from the latitude of 16° which is that of the middle of the Island, they should sail westward to get sight of it.

"Though it may seem natural enough not to suspect any errors of consequence in your reckoning in so short a passage as from the Canaries to the Isles of Cape Verde, yet there are instances of such, as well to easting as to westing. It is with respect to errors in our westings that I advise all vessels to keep 30 leagues to windward of Bonavista, before they stand in to make the land; lest in keeping a direct course for that Island, they should pass between the Isle of St. Nicholas and the Isle of Sal; and, finding themselves to westward of Bonavista, when they reckoned themselves to be still to eastward of it, they should miss of their refreshments at the Isle of St. Iago, an accident which has happened to several vessels*.

"The making of these Islands is often difficult, occasioned by the fogs, which hang frequently around them. For this reason, those

* To these remarks of M. D'Apres, he adds, "In the month of December, 1750, a like accident happened to myself, when I commanded the ship *le Glorieux*. During the night time I passed between the Isles of Sal and St. Nicholas, without knowing it, which was occasioned by a difference in my reckoning of 30 leagues to the westward. Making sail, after that, to westward, in the latitude of Bonavista, I might have traversed about these Isles without getting sight of any one of them, if an observation I made of a lunar eclipse, in the month of December, had not convinced me of my error. So soon as I was certain of it, I directed my course southward, and a sight of the Isle of Fogo convinced me that I was right. To say the truth, I had neither had sight of Madeira or the Canaries.

who come from the northward ought to steer their vessels in this track with all possible precaution." (*See remarks on Bonetta Rocks, below.*)

"The most convenient course for vessels which continue their voyage from the Canaries, without touching at the Islands of Cape Verde or Goeree, is to steer, after they lose sight of the Canaries, so as to pass about 45 leagues west of Cape Blanco (or near the meridian of 20° ;) from this position they will make good their course due south, as far as 12° N. and afterwards S.E. by S. till they meet with those variable winds which succeed to the trade winds. By this they will keep the mid-channel between the islands and Cape Verde, and coast along the bank below that Cape at a sufficient distance, even though they should make an error in their reckoning of 15 or 20 leagues to eastward."

THE CAPE VERDE ISLANDS.

These islands, which derive their name from Cape Verde, the nearest point of the coast of Africa, are 10 in number, namely; Ilha de Sal, or Salt Island; Bonavista; Mayo, or the Isle of May; St. Iago; Del Fuego, or Fogo; Brava; St. Nicholas; St. Lucia; St. Vincent; and St. Antonio; besides several small islets.

The Channel between *Cape Verde* and the islands, is not so much frequented as it formerly was. Those who do pass this way, generally keep in longitude between 19° and 20° W. in passing the islands, to avoid some dangers, supposed to lie to the eastward of them, not well ascertained: others keep nearer to the continent, because the channel is clear on that side. Were it not for the great haze contiguous to the coast, occasioned by the dust and dry vapour, driven by the N.E. winds from the hot sandy desert, the passage near the main would be preferable to that on the west side of the Cape Verde islands, when the sun is far to the southward; because steady northerly winds then prevail near the continent, and the *Route* is much shorter than that to the westward: but the obscure atmosphere, generally renders the inner passage unpleasant, when observations cannot be regularly obtained. The outward bound ships that frequented this passage about 40 or 50 years ago, generally steered along the coast adjacent to Cape Verde, in regular soundings near the shore, with the lead going in the night, and under easy sail.

A *Reef* is said to project a small distance from Cape Verde, but the soundings decrease regularly to 10 or 8 fathoms off it. The *Porgus Bank*, placed in some Charts about mid-channel between Cape Verde and the islands, probably has no existence, as many ships have passed over the position assigned to it without getting soundings.

The *Bonetta Shoal and rocks*, is the danger most avoided by ships in passing through this channel: according to a plan of Mr. Norris, of Liverpool, they are $3\frac{1}{2}$ miles from S.W. by S. to N.E. by N. and about $1\frac{1}{2}$ mile in breadth, having 35 fathoms water, small white gravel

stones, at $2\frac{1}{2}$ miles to the southward of them, and 20 fathoms red coral, at $1\frac{1}{2}$ mile distance. He places them at 42 leagues, E. by N. nearly, from the north end of Bonavista. They have also been stated to lie 22 leagues eastward of the channel, between Salt Island and Bonavista. It is remarkable that this danger is so little known, and from the above statements it is difficult to assign any position to it.

There is said to be a *Reef of Rocks* 6 leagues North-eastward from Bonavista, more dangerous than the Bonetta reef; another account says, this danger is 10 leagues from that island, and is even with the water's edge; but, like the Bonetta rocks, its real situation appears to have never been determined; and its existence is even doubted.

ILHA DE SAL, or SALT ISLAND, the north-easternmost of the Cape Verde Islands, is uninhabited, and appears in its N.W. part, high and irregular. Its hillocks and vallies extend to the water's edge both on the eastern and western sides, but it is most remarkable in being a narrow island, with its S.E. end running out in a long sandy spit, which being very low and flat, cannot be distinguished at a distance from the high land. The spit is full 3 miles in length, and has, on its north side, a reef on which the sea breaks in several places, at about a mile from shore.

This island may be seen in clear weather at the distance of 12 or 14 leagues, appearing like two islands. On its west side are three bays, of which, the northernmost is very narrow and shoal; but near it is the only fresh water upon the island, which is in a small well, affording about half a ton a day. About 4 or 5 miles to the southward of this bay is an islet called Bird Island, at about one quarter of a mile from shore; but there is no passage for ships between. To the southward of this islet is *Mordeira Bay*, which is one of the best in the Cape Verde Islands; but the bottom is rocky as in all the other bays. This bay is large, and the bank stretches to some distance from shore; and the coast being low, it is not subject to so many squalls, nor so heavy a swell, as the bays in the other islands. The best anchorage is at about half a mile from shore, in 6 or 7 fathoms water, with Bird island shut in with the west bluff, bearing about E. N.E. by compass, and the south point of the bay south, distant about 4 miles.

From Mordeira bay to the south point of the island the distance is about 11 or 12 miles: between, at the distance of half a mile from shore, there are 6 or 7 fathoms water. Be careful in rounding the south point which is low, and approach it no nearer than 9 or 8 fathoms water. The island derives its name from the number of Salt-ponds upon it, where the water christallizes into a beautiful salt, the chief production of the isle; as the land is so barren as to bear nothing but a few inconsiderable shrubs. The coast is frequented by turtles. Its N.W. point is in latitude $16^{\circ} 50' N.$ and longitude $22^{\circ} 55' W.$

BONAVISTA or *Boavista*, (Good Sight) has been so called from its beautiful appearance when first discovered: its face, rugged and uneven, is variegated with alternate hills and dales, formerly fertile, now

barren ; and in some places, low points project into the sea ; its S.E. point in particular is low and projecting, and not discernable until near it. Salt is the principal article of trade. The principal place is *English Road*, on the N.W.

The eastern side is entirely bordered by a reef ; and on the N.E. are the reefs on which the Hartwell, East India ship, was lost, in 1787 ; and on which the Resolution, Captain Cook, was nearly driven by a southerly current. There is also on the western side a shoal of 10 feet water, on which the sea generally breaks, and on which the current, at times, sets with rapidity.

From the south end of Ilha de Sal, the N.W. point of Bonavista lies nearly south, distant 9 leagues ; and from the same end of Sal, to clear the N.E. reefs, the course by compass is S.E. about 11 leagues, in order to allow for the current that sets to the S.W. on Bonavista. The N.E. reefs extend about 5 miles from shore, and their extremity lies in latitude $16^{\circ} 8'$. When arrived here, three small kays or islets may be seen, which the reefs tail from ; and many rocks lie here scattered, with only 12 or 13 feet on them, and 4 fathoms close to them, on which, in blowing weather, the sea breaks very high.

The above mentioned islets are named the North, the South, and the Middle, Kays ; and between their reefs are three channels, the best of which lies between a ledge of rocks situate to the S.E. of the Middle Kay, always visible, and the South Kay : this channel is three quarters of a mile broad, and has regular soundings from 15 to 5 fathoms. Vessels may anchor under the Middle Kay, with the Kay bearing N.E. by E. and the South Kay S. by W. by compass ; and they may moor at half a mile from the Middle Kay, in 6 or 7 fathoms tolerable good ground. Under this Kay the *Braithwaite* sloop lay, during several months, as the most convenient place for going out to the wreck of the Hartwell, which bears E.N.E. by compass, 2 miles from the Middle Kay, and N.E. 5 or 6 miles from the body of Bonavista.

The Middle Kay lies about 2 miles from shore ; and between it and the North Kay there is a passage about half a mile broad, through which vessels may pass in 7 or 8 fathoms. There is also a passage between the South Kay and Bonavista, through which a ship may sail in 6 or 7 fathoms, but it is narrow.

The South Kay bears from the Middle Kay south, distance three miles ; the North Kay from the middle N.W. $\frac{1}{2}$ N. $1\frac{1}{2}$ mile. The North and South Kays lie about half a mile from shore ; the former has a reef with 5 feet on it, extending from it to the shore. When the North Kay is in one with *Mount Ochel* or the N.E. high mountain in Bonavista, it then bears W.S.W. and from the anchorage above mentioned, Mount Ochel bears W. by S.

From the North Kay to the N.W. end of Bonavista, the course is W.N.W. and thence to *Small Island*, English Road, the course is S. by W. distant about 5 miles.

English Road. In sailing into English Road from the northward, leave Small Island on the larboard side, borrowing to it, into 7 or 6 fathoms, in order to avoid the *ten-feet-reef*, that lies nearly S.S.W.

about a half a mile from a remarkable white patch on Small Island. In a fair-way, are 8 fathoms water, and when within the reef 7, 6, and 5 fathoms: this reef is about 100 fathoms in length N.N.E. and S.S.W., and the sea sometimes breaks upon it. The marks for the anchorage, in 5, 6, or 7, fathoms, are, the Platform on the Mount S. by E.; the Man Mountain S.S.E. and Small Island N.N.W. at half a mile distance. The ground is foul, and sometimes the sea breaks in every part of the bay. A strong current sets out of the bay to seaward, which sometimes causes the sea to run so high, as to break on the deck.

In the rainy season, that is, during the months of July, August, and September, this island is subject to light airs of changeable winds, with heavy swells in the roadsteads.

English Road is in latitude $16^{\circ} 4' 35''$ north, and longitude $22^{\circ} 50' 15''$ west. It is high water, on full and change days, at half past seven o'clock, and the tide rises 5 feet. There is no fresh water to be had for shipping at Bonavista.

About 4 leagues to the S.W. from English-road there is a reef on which the sea breaks: in sailing through the channel between this reef and the *ten-feet-reef* before mentioned, steer W. by S. about 4 leagues, and then haul to the southward or northward as convenient.

Portuguese Road. To the eastward of the reef just described, is *Portuguese Road*, where ships may anchor in 6, 7, or 8, fathoms, with the Platform mountain bearing about N. by E; the south point of the road S.E. by E. distant 2 miles, and the landing place nearly N.E.

Leton's Rock, or Reef, is very dangerous, and much in the way of ships passing to the westward of Bonavista. This reef extends E. N.E. and W.S.W. about $1\frac{1}{2}$ mile in length; on the north end which is steep-to the rock appears above water, about the size of a ship of 200 tons, and the sea breaks very high and heavy on it with a great noise: on its S.W. side, in 10 fathoms water, the bottom, which is rocky, can be seen swarming with fish. Various positions have been assigned to this rock. It was seen in H. M. Ship *Bulldog*, when sailing from Bonavista, just even with the surface of the sea, which was breaking very high on it, and making a great noise; it then bore W.N.W. by compass, about $1\frac{1}{2}$ mile; at the same time English Road bore by compass N.E. 6 or 7 leagues; the south high land of Bonavista E.N.E. 8 leagues; and the Isle of May S.S.W. 8 leagues.

There seems to be another reef considerably to the northward of the Leton rock, and much nearer to Bonavista. These dangers, render the channel to the westward of Bonavista unsafe* in thick wea-

* This has been fatally experienced in the lamentable loss of the *Lady Burgess*, East India ship, one of the outward-bound fleet, which ship struck among the breakers on the Leton Rocks, at two in the morning of the 19th of April, 1806. The *Alexander*, *Sovereign*, *Lord Nelson*, and other ships, narrowly escaped. The *Lord Melville* struck three times, and slipped off the rocks into 25 fathoms, at the time the *Lady Burgess* was standing directly among the breakers. It appeared, from the observations subsequently made, that the Leton Reef is com-

ther, or in the night; for it is thought the sea does not break on these reefs with smooth water.

MAYO, or ISLE of MAY. This island is about 3 leagues in length, is pretty high at the centre; and from its north end, which is also high land, a reef extends about 3 miles to the northward. On approaching the island from the S.E. the appearance is very different from that in approaching it from the northward: you first descry, in the north part, two hummocks, appearing like islands; on a nearer approach the land which connects them will appear. Southward of these, is a mountain, with very low ground to the south, over which two hillocks are seen. From Bonavista, May island bears about S. by W. distant 14 or 15 leagues.

English Road in latitude $15^{\circ} 6'$ N. and longitude $23^{\circ} 12' 19''$ W. is a sandy bay under the S.W. point of the island, where merchant vessels load salt and live stock. Here ships may anchor in 7 or 8 fathoms water. The landing is indifferent, no good water to be had, and the place is quite defenceless. The shore to the eastward of and abreast of the town of May, is steep, bluff, and rocky; but to the westward, a low white sandy beach extends to a rounding point from which a spit of sand and coral projects a few cables' lengths, at a short distance from the extremity of which there is no ground at 45 fathoms. This spit may be rounded in 18 to 15 fathoms, and a ship should not anchor farther out than 16 or 17 fathoms, the edge of the bank being steep. There are $16\frac{1}{2}$ fathoms, with the west point of the bay bearing N. 10° W. by compass, the town east and the south point of the bay S. 59° E. one mile from shore.

St. IAGO is the chief of the Cape Verde islands: it is about 39 miles in length and 20 miles in breadth. The land is very high, and the eastern coast is bordered with rocks lying very near the land, along by which ships may sail very safely, at the distance of 2 miles. In running from Bonavista to St. Iago in the night, ships must be cautious how they approach Mayo, on account of the reef before mentioned, at the north point of that island. Having passed that point, they may steer S.W. to make the land of St. Iago, and run

posed of coral; no part above water. Captain Swinton, of the *Lady Burgess*, conjectured that the extent on which a ship would strike, is not above a cable's length, and that there are no breakers on it, in fine weather. To the northward it appeared steep-to.

It has also been conjectured that this danger is on the northern limit of an extensive bank of coral soundings, extending a great way to the southward, and considerably to the eastward and westward. At day-light the *Asia* was in 52 fathoms, coral bottom, when the breakers and wreck bore E. by N., about 6 miles distant; and other ships had soundings from 25 to 50 fathoms to the west and S.W. of the reef, at from 2 to 5 or 6 miles from the breakers. Immediately after striking, the *Lord Melville* had 25 fathoms, with her head to the eastward; and shortly after, 30 fathoms. This ship hove-to with her head easterly until day-light, and had from 30 to 40 fathoms, all coral soundings. Others carried soundings 10 or 12 miles to the southward of the rock, generally coral, sometimes intermixed with sand and shells, and never had less than 20 fathoms. The mean of the observations and chronometers of the fleet, gave $15^{\circ} 49'$ N. and $23^{\circ} 14'$ W., as the situation of the rock, which is North of the Isle of May; but as no land was seen, the relative situation cannot be shewn exactly by these observations.

along the coast until they make the Road of Praya. This is the best course to steer with the wind inclining from the northward, or N.N. W.; but if the wind hang from the eastward Mayo should be passed on the east side, and when round the south point, steer westward for the S.E. point of St. Iago, and thence to the Road of Praya.

The S.E. point of St. Iago appears long and low, when seen either from northward or southward; and from this point 6 or 7 miles S.W. by S. lies the east point of Port Praya, the principal port in the island. Between the two, but nearer the former, lies a bay, which so much resembles that of Port Praya, that many vessels, deceived by this resemblance, have run the hazard of being lost in this dangerous place: at the bottom of it are several cocoa-nut trees, and a few houses. The land between this and the point of Port Praya, is mostly perpendicular; and though the Fort of Port Praya, which stands on a cliff, is a mark by which the true bay may be distinguished from the false one, yet the surest mark is, that the north or east point of the false bay is surrounded with breakers; whereas the east point of Port Praya is high, steep, and free from danger, and may be passed within a cable's length in 8 or 9 fathoms. The same distance from the east side of the bay, in 7 or 8 fathoms, is best in sailing to the anchorage.

Port Praya is a fine bay, lying between two points, which bear from each other W.S.W. and E.N.E. at the distance of $1\frac{1}{2}$ mile. As you sail round the east point, the fort at the bottom of the bay will soon open, to the westward of which, in a valley, are several cocoa-nut trees, and a small house. The winds, except in the tornado season, are generally in the N.E. quarter with frequent squalls, therefore a ship, on approaching the east point of the bay, should have her top-gallant sails furled, and a reef or two in her topsails. The eastern shore of the bay is high, and all the land seems parched, and barren: in the western part of the bay is a small black island, flat at the top, but rugged at each end, called the *Isle of Quails*, having a rocky projection from its south end, about half a cable's length; there is also a rocky ledge off the north end, where the water is in general shallow, for 3 fathoms is the greatest depth between this isle and the fort. Within, to the westward of the island, it is only navigable for boats. From the west point of the bay, some rocks extend to seaward, which require caution to avoid them, in sailing from the anchorage in the night.

The best anchorage is in 7 or 8 fathoms, with the fort bearing N. W. $\frac{1}{2}$ N. by compass, about a mile distant, and the east part of Quails Island W. by S. or W.S.W. $\frac{1}{2}$ W. But it is more convenient to anchor nearer the north-east side of the bay, than the Isle of Quails, for the sake of more easily getting under sail, without running the risk of being carried by the currents, upon the point of the rocks to leeward, before the vessel has gained fresh way enough to steer clear of them. The Earl Talbot, East Indiaman, lay in $7\frac{1}{2}$ fathoms, black sand, with the flag-staff on the hill, bearing N.W. by N. by compass; Tubaroon point, the west extreme of the bay, S.W. by S.; south point of Quails Island W.S.W. $\frac{1}{2}$ W., and the east point of the

bay S.E. by E. $\frac{3}{4}$ E. ; off the landing place, 1 mile, and about 2 cables' lengths off the north east shore.

In Port Praya the volcano of I. del Fuego may be seen over the land of St. Iago, bearing about west.

The well from which the ships are supplied with water, is at the bottom of the hill upon which the Fort is built, about a quarter of a mile from the beach. The water is not always very good, being more or less brackish, particularly in dry seasons. Captain Heywood advises large ships to send on shore a pump to place in the well, by which they will be sooner watered, than if the water were drawn up from it in the common manner with buckets. Some planks carried on shore will be useful to place under the casks in rolling them down, where the ground is stony or uneven, or where it is soft sand, which is often the case. As there is generally some surf on the beach, boats should lie at their grapnels, and the casks of water be hoisted into them, after being filled at the well or cistern, rolled down and floated through the surf.

The anchorage in Port Praya is in latitude $14^{\circ} 53' 40''$ N. longitude $23^{\circ} 30'$ W., by mean of many ships' observations and chronometers. It is high water on full and change days, at 6 o'clock, and the vertical rise is about 4 feet. Ships bound to the East Indies frequently touch here for refreshments: it produces oranges, lemons, limes, grapes, cocoa-nuts, pine apples, and other fruits. The bullocks are small, but good for the climate; there are also goats, pigs, fowls, and turkies, all tolerably reasonable, which may generally be had much cheaper for cash than bills.

It seldom rains here, but a dry haze is very prevalent. In December and January the wind hangs sometimes far to the eastward, veering at times to the northward. In settled weather, there are often regular land and sea breezes in the bay; the sea breeze setting in near noon, and ending at 4 or 5 o'clock in the afternoon: the N.E. wind begins towards evening, and continues during the night.

Ships bound from Port Praya to Bonavista, should endeavour to sail in the evening, as the current at that time is favourable: they should not stand too far over towards the African Coast, nor work between Mayo and St. Iago, and they will then get to the eastward fast.

DEL FUEGO, or FOGO. This island is much higher than any other of the Cape Verde Islands, and is only an immense volcanic mountain that continually smokes, and sometimes throws out flames and liquid sulphur. It has, in consequence of the frequent eruptions of the volcano, but few inhabitants, and these, at times, are obliged thereby to quit the island. The ground is clear within a mile of the shore, on the N.W. west, and south, sides; but on the S.E. east, and N.E. sides it is rocky. About 4 miles off from the north end of the island, is a rock with 12 or 14 feet water on it, over which the sea breaks in blowing weather only: the ground is clean all around it.

On the western side is a little town, off which vessels may anchor in 10 fathoms water, with the town bearing E.N.E. distant a quarter

of a mile, and the peak N.E. by E. The ground is foul, the bay open, and the landing very bad. Corn, fruit, and cattle, may be purchased here, but water is scarce, there being no running stream. The volcano may be sometimes seen at the distance of 34 leagues: the summit of the Peak is in latitude $14^{\circ} 56'$ N. longitude $24^{\circ} 24'$ W.

BRAVA. This island lies about 18 leagues to the westward of St. Iago, and, in comparison with the great height of Fogo, it appears but low, although its land is high, and its mountains rise like pyramids, one above another. It produces plenty of salt, and abounds most with saltpetre of any of the islands. Three small islets lie off from its north end, the easternmost of which is about 5 leagues west from the N.W. point of Fuego, and there appears to be a shoal stretching towards the N.E. about a mile from it; therefore, when sailing between Del Fuego and Brava, it is proper to keep about one-third of the channel over from the former.

There are several bays and roadsteads on the N.E. side of the island where a ship may anchor; but, excepting one, they are exposed to the trade winds from East and N.E. except in July, August, and September. The best is called *Furno*, or the *Oven*, and lies toward the east end of the island, but the entrance is narrow, which obliges ships to warp out. *Port Turreo* on the south side, and *Port Fagen Dago*, on the west side, are also good havens, where water, corn, live-stock, and fruit, may be procured.

The natives are very few, and those are blacks, but they are the most hospitable, harmless, and generous, of all the islanders. The road on the west side is in latitude $14^{\circ} 51'$ N. longitude $24^{\circ} 56'$ W.

ST. NICOLAS is about 10 leagues long, and 3 leagues wide. At this island, vessels of different nations occasionally touch for refreshments; as cattle, hogs, poultry, fruits, &c. which are sold at moderate prices. The land being mountainous, the coast is therefore subject to heavy squalls and sudden calms.

From English Road, in Bonavista, to the east end of St. Nicolas, the bearing and distance are W.N.W. $\frac{3}{4}$ W. 80 miles, and from the N.W. point of Salt Island W.S.W. $\frac{1}{4}$ W. The east end of this island may be known by its platform point, having a pyramidal rock, which, at a short distance, appears like a sail: it is in latitude $16^{\circ} 25'$ N. longitude $24^{\circ} 10'$ W.

At the distance of 6 or 7 miles from this end of the island, on the south side, is *Preguica Bay*, having a pond of fresh water, abundantly supplied from the mountains, and hence sometimes called *Freshwater Bay*. To anchor in this bay, shut all the land to the eastward within the east point of the bay: you will be about 2 miles from shore, in about 7 fathoms water. There is good landing for the boats, and plenty of good water in fine weather, and at neap tides. It is high water on full and change days at 7 o'clock, and as spring tides rise 5 or 6 feet, the pond is then overflowed. At these times there are frequently heavy squalls, and, although the wind blows off shore, the sea runs very high on the beach,

Grand or *St. George's Bay* is on the N.W. side of the island, and is the only place where refreshments can be obtained, but there is no

water; the residence of the Bishop is in a town about 4 miles from it. This place is known by a sugar-loaf mount, and by a flag-staff on the hill above the bay: there is tolerable good anchorage in 7 fathoms close to the shore, but farther out, in 9 or 10 fathoms, the ground is rocky. A shelf stretches off from the east point of the bay, to the S.W. by S. on which is less water than within it: to avoid it, give the point a berth of two cables' length, approaching it no nearer than 6 fathoms. The marks for anchoring are, the sugar-loaf mount bearing E.N.E. and the flag-staff S.E. at the distance of a quarter of a mile from the cove, or landing place, N.W. by W. Be cautious, that your anchor may not start by a sudden squall, lest it hook on the bank, and thereby be lost; the bank being very steep, and squalls frequent.

Tarrafal Bay lies to the S.E. of the former, and affords good anchorage in 9 or 10 fathoms. By digging a well, almost any where on the low land, water may be obtained, unless the rainy season has failed; but there is always water in the valley, about half a mile from the sea, whence the natives bring it down on asses for a trifle. From this bay may be seen, in clear weather, all the leeward islands; but, if it be in the least hazy, the Isle of Chaon will not be discernable.

ST. LUCIA, about $3\frac{1}{2}$ leagues northward from St. Nicolas, is about 5 leagues long, and 5 miles broad, hilly, and not inhabited. There is good anchorage in a bay or haven on its S.E. side, within two small isles, called Round and White Islands. There is anchorage also on the N.W. side, in 20 fathoms water.

ST. VINCENT, lying about 3 leagues to the north-westward of St. Lucia, is about 20 miles in length, and 7 miles broad, very rugged and mountainous, and, although not inhabited, is well stored with wood and water; and there are many wild goats and asses.

It has a good bay on the N.W. side, capable of holding 250 sail of large ships, called *Porto Grande*, which is the largest and best bay in the Cape Verde Islands. The ground is tolerably clear, and, by digging wells, fresh water may be had: there is likewise plenty of wood. At the entrance is a round rock, resembling a sugar loaf, which is steep to all around; and may be passed on either side, as near as you please, in from 20 to 7 fathoms water. There are 13 fathoms at a cable's length from each point of the bay, and within, the soundings are regular to 7, 6, and 5, fathoms. Between the north point of the bay and a rocky point above it, you may anchor in 6 or 7 fathoms, half a mile from shore: there is also anchorage in the middle of the bay, in 6 fathoms, with the round rock on with the northern part of St. Antonio, bearing about north, distant $1\frac{1}{4}$ mile.

South Bay, on the S.W. side of the island, is considered the safest anchorage on account of the prevailing N.E. trade wind. Here are 22 fathoms, sand and bits of shells, at $2\frac{1}{2}$ or 3 miles from the shore, and about 4 miles, from each extreme of the island.

From the S.W. end of St. Nicolas to the S.W. end of this island, the course and distance are N.W. by W. 11 or 12 leagues; between them lie the two small isles of *Chaon*, or *Dog Island*, and *Redonda*, or *Round Island*, called also *White Island*, with the larger island of

St. Lucia, before described. There is a good passage for sailing to the northward, between *St. Nicolas* and *Chaon*; likewise between *Round Island*, and the east side of *St. Lucia*; but the channel between *St. Lucia* and *St. Vincent* is dangerous, having many sunken rocks.

ST. ANTONIO, the north-westernmost of the Cape Verde Islands, is about 9 leagues in length and 4 in breadth. Upon it are two remarkably high mountains, the highest of which, called the Sugar-loaf, is, according to Captain Horsburg, 7400 feet above the level of the sea, and may be seen, in clear weather, at the distance of 30 miles, from a ship's deck; but this is seldom the case, as both are generally covered with clouds. The island is very woody, but has plenty of goats, fruits, and salt; it produces wine, cotton, indigo, &c.; and refreshments may be readily purchased here. On the S.E. side stands the small town of *Santa Cruz*, with a bay before it, in which the ground is very indifferent.

The south point of St. Antonio bears from the S.W. end of St. Vincent W.N.W. about 5 leagues. Ships, when working up to *Porto Grande* of St. Vincent, which is always the case with the common trade wind, should not approach St. Antonio nearer than a mile, but they may stand as near as they please to St. Vincent: the current generally sets strongly through to the N.E.

The north-west point of St. Antonio is in latitude $17^{\circ} 12' N.$ and longitude $25^{\circ} 13' W.$

Before the use of chronometers and lunar observations, it was desirable for outward bound ships to see this island, if they had not previously seen Madeira or Palma, in order to correct the reckoning; but, if a ship have good instruments on board, this is now not requisite. Nevertheless, St. Antonio may be passed in sight without being apprehensive of any delay by light winds, or calms, provided it be not approached too close.

DIRECTIONS for sailing from the CAPE VERDE ISLANDS across the EQUATOR.

During the summer months, particularly when the sun is in the northern hemisphere, outward bound ships should not run too far to the westward, for in this season it has sometimes happened that the north-east winds have continued longer with ships in longitude 19° to $23^{\circ} W.$ than with others which had separated from them, and lost the trade in 25° to 27° west longitude.

When the sun is near the tropic of Cancer the trade wind has been often found to fail near, or in sight of, these islands; it has therefore been recommended to ships, at these times, to pass the islands to the westward, at the distance of 8 or 10 leagues at least, in order to preserve a steady wind, and prevent delay, as light eddy winds prevail near and amongst them at this season. Whether a ship pass between Cape Verde and the islands, or to the westward of the islands, she should, on getting to the southward of them, steer to the south-eastward, if the wind permit, so as to get between the meridi-

ans of 18° and 23° at losing the north-east trade wind. Should the southerly winds then commence, she may take advantage of the shifts to stand on the tack which will gain most to the southward, so as to cross the equator between the longitudes of 18° and 23° W. if the winds will permit. With a dead southerly wind she should not stand long on either tack, in hopes of meeting a better, unless the wind should veer so far as to enable her to gain much southing.

The south-east trade wind, at its northern limit, generally inclines far to the southward, particularly in July, August, and September; and sometimes in other months. A ship meeting this trade should not be kept too close to the wind, but kept clean full, to enable her to make good way through the water, to the south-westward, and clear of the southern limits of the westerly current that generally prevails about the equator, from 4° or 5° north latitude to 3° or 4° south latitude, and from longitude 26° or 27° west to Cape St. Roque. From September to March it runs very strong. In proceeding to the southward the wind will draw more to the S.E. and then to E. and E.N.E. at the southern limit of the trade.

There are many journals which tend to prove that the N.E. trade wind is deflected by the projection of Cape Verde to the westward, and that ships which keep near the coast of Africa lose the trade sooner than others which are at a greater distance from it. Therefore it is recommended by many commanders to keep well to the westward, with a view to continue it longer, to have fewer calms and baffling winds in the variable space, and to meet the S.E. trade-wind sooner than if farther eastward. In consequence of which, several ships have crossed the equator far west, and then met with the S.E. trade blowing far from the southward, which with the co-operation of strong westerly currents has driven them farther west, so that some have not been able to clear Cape St. Augustin, and others have made the Brazil coast about Cape St. Roque, or farther to the westward.

But *M. D'Apres* has observed, that there is not one instance to prove, that, by passing the line to the *eastward* of the limits above mentioned, ships have met with calms of a long duration, and currents setting with great rapidity towards the river Gabon, as had before been generally imagined. He says, "Vessels which sail from St. Iago should steer S.E. as far as the 12th degree of latitude; after that S.E. by S. Those which depart from Goeree should steer S.S.W. if they desire to keep clear of the coast till they reach the parallel of 10 degrees; thence their course should be S.E. by S." His words on crossing the line are, "When the variable winds succeed the trade winds, the best method of crossing the line with speed is to take the advantage of the very first variable winds, for gaining the ordinary track of the general winds so soon as you possibly can; and, for this end, to keep indifferently on that tack which bears most to southward, without troubling yourself about crossing the line at any determinate point, lest you make your voyage longer than is necessary."

The opinion of *M. D'Apres* has been corroborated by *M. la Pe-rouse*, whose remarks on the subject are, in this place, worthy of

particular notice. He says, "Nothing particular occurred during our passage to the line. The trade wind left us in 14° north, and the wind then constantly blew between W. and W.S.W. till we reached the line, and obliged me to run down the coast of Africa, which I did at the distance of 60 leagues.

"We crossed the line on the 29th of September 1785, in 18° west longitude, ($15^{\circ} 40'$ W. of Greenwich.) I could have wished, as my instructions were, to have passed it more to the westward; but, fortunately the wind drove us always to the eastward, otherwise it would have been impossible to have made Trinidad, the wind being S.E. at the line, and continuing so until we reached latitude $20^{\circ} 25'$ S.

"Navigators, who are apprehensive at *this season of the year*, of meeting with calms under the line, are greatly mistaken. Not a day passed without a breeze, nor had we rain more than once, but it was then, indeed, so copious as to enable us to fill 25 barrels.

"The fear of being carried too far to the east, into the Gulf of Guinea, is equally chimerical. The S.E. winds begin to blow early, and drive on the contrary too rapidly to the westward. If I had been better acquainted with the navigation of these seas, I should have borne away more large with the S.W. winds, which constantly prevailed to the north of the line; and I might then have crossed it in the longitude of 10° ($7^{\circ} 40'$ W. of Greenwich.) This would have permitted me to run with a free wind, on the parallel of Trinidad.

"We had left Teneriffe but a few days when we lost sight of that beautiful sky, which is to be found only in the temperate zone. A dull whiteness, partaking both of clouds and fog, continually obscured the atmosphere, so that the horizon appeared to be less than even 3 leagues in extent: but this was only in the day; after sun-set the vapour disappeared, and the nights were regularly fine."

Ships departing from Port Praya, and bound to the *Cape of Good Hope*, or having passed to the westward of the Cape Verde Islands, and arrived in latitude of St. Iago, may haul as close to the wind as convenient, according to the season, so as to meet variable winds far enough to the eastward, and be enabled to get on to the southward, and cross the equator in from 18° to 23° degrees of west longitude from Greenwich. This appears to be the most eligible track. It would be a loss of time to *endeavour* to cross farther eastward, for the passage depends upon getting through the variable winds, into the S.E. trade-winds, and then to proceed with flowing sheets.

Those bound to the *Coast of Brazil* may cross the line farther to the westward, according to the situation of their port of destination; but if bound to Pernambuco, or to the southward of Cape St. Augustin, they should not exceed the 26th or 27th degree of west longitude, for the reasons before stated.

In latitude $5^{\circ} 4' 23''$ N. and longitude $21^{\circ} 25' 40''$ W. is a shoal over which the Warley E.I.S. passed on May 7th, 1813. They had no time to sound, but supposed there were about seven fathoms on it: the bottom was distinctly seen, and consisted of ridges of rocks with sand between them. It is of small extent, not exceeding a quarter of a cable in length.

St. Paul's island, called also Panedo and St. Peter's, lies in $0^{\circ} 55'$ N. and latitude $29^{\circ} 15'$ W. It is composed of an assemblage of steep rocks without verdure, covered with bird's dung, and with no place fit for anchoring, or convenient for landing. This small island has been seen by Indiamen both outward and homeward bound, although it is considerably to the westward of the common course of the latter; and no ship bound to the southward should cross the equator so far west.

Fernand de Noronha has not unfrequently been visited or seen by ships bound to India, occasioned by the currents having set them to the westward, after the failure of the north-east trade wind. It is a remarkable island, and is readily known by a high rocky peak called the pyramid, very barren and rugged, which seems to lean to the eastward, when it bears S.S.W., and by its S.W. point, which is perforated and gives a free passage to the sea, and therefore by some called the hole in the wall. Off this point, at a considerable distance, lies a sunken rock which is dangerous to approach. From the S.E. part of the island, named Tobacco-point, a reef extends to seaward a considerable distance; and a rocky patch on which the sea always breaks, lies $2\frac{1}{2}$ or 3 miles S.E. by S. from this point, and nearly $3\frac{1}{2}$ miles S. $\frac{1}{4}$ W. from the east point. There is a channel of 10 to 15 fathoms water within this patch, and when on it, the pyramid will be shut in by the highest hill.

This island is about 7 miles in length, and 2 or $2\frac{1}{4}$ miles broad: it produces black cattle, sheep, poultry, melons, corn, &c. It is inhabited by Portuguese exiles, and has a strong garrison; and all the little sandy bays and anchoring-places are defended by forts. The road is on the north side near the N.E. end of the island, and the anchorage is tolerably good in 9 to 13 fathoms water, at about half a mile from shore, with the pyramid bearing from S.S.W. to S.W. It is quite exposed to northerly and westerly winds, which are said to prevail here from December to April, at other times they are mostly south-east, or easterly, and sometimes at N.E. The surf is frequently high, and at such times there is no landing. Fresh water may be procured from a well near the governor's house, but it is a scarce article in the dry season, and cannot always be got off from the shore on account of the surf. On the south side of the island, to the eastward of Tobacco-point, is a small bay called the Port, fit for boats only, where it is said fresh-water may be procured from a rivulet.

The currents generally run strong to the westward, therefore the necessity of approaching the road by Rat or Wooding island is obvious. Rat island is about $1\frac{1}{2}$ mile in length, and lies about $1\frac{1}{4}$ mile from the N.E. end of Fernand de Noronha: it produces grass and firewood, with some wild goats; but the wood will sink if thrown into the water, and there is great risk in staving the boat while getting it off from the rocks.

The pyramid is in latitude $3^{\circ} 55' 15''$ south, and longitude $32^{\circ} 35' 30''$ west: the tide rises about 6 feet, and flows on full and change days of the moon, until 4 o'clock.

The **ROCCAS** are low sandy keys with shrubs on them, and cannot be seen in the clearest weather, more than three leagues from the mast head. They are particularly dangerous to ships sailing between Fernand de Noronha, and the coast of Brazil by night, if they are not certain of their relative position from the former; for they are liable to be carried by the strong westerly currents, more to leeward than may be apprehended. The East India ship *Britannia*, and King George transport, were wrecked on these keys at 4 A.M. Nov. 2nd, 1805. They lie about eighteen leagues to the westward of Fernand de Noronha, in latitude $3^{\circ} 52' 30''$ S. and longitude by mean of observations and chronometers of 10 different ships, $33^{\circ} 31'$ west: their whole extent is about 5 miles, and at their north east end is a pretty high rock: the sea breaks exceedingly high all around them. When the above ships were wrecked, the current set at the rate of $2\frac{1}{2}$ knots to the westward: the tide rose and fell 6 feet. There are 28 fathoms about 2 miles from their west extremity.

According to Pimental, a shoal lies 17 leagues S.S.W.; another, according to the Portuguese, about 25 leagues to S.W.; and another, discovered by the English, 45 leagues to W.N.W. of Fernand de Noronha.

COAST OF BRAZIL.

From CAPE ST. ROQUE to MARANHAM.

CAPE ST. ROQUE is the north easternmost promontory of Brazil; it lies in $5^{\circ} 6'$ south latitude, and $35^{\circ} 40'$ west longitude. The banks of St. Roque extend about 7 or 8 leagues to the northward of the Cape, and 12 or 13 leagues to the westward, dry in many places, with several navigable channels between them. Between the S.E. extremity of the banks and the cape, there is a narrow passage of $1\frac{1}{2}$ mile in breadth, with 4 fathoms water in it: close to the east end of the banks there are 7 fathoms, and at the distance of 3 leagues, 36 fathoms.

About seven leagues to the westward of Cape St. Roque, is *Point Delgado*, the west point of the River Vermelho, or Red River, so called from some red cliffs on its east side; about midway is Point Seara. A bank lies before the mouth of the river, having a passage on each side of it, with $2\frac{1}{2}$ to 3 fathoms water, in the westernmost of which a vessel may anchor. About 7 leagues farther westward is Brandu Bay, and the river Doce; whence the coast tends to N.W. by W. and W.N.W. to *Point Pedras* on the east side of Paranduba bay. From point Delgado to Brandu bay, the coast is mostly flat, and barren; between the latter and Point Pedras, the country is bare and black, its surface covered with sand, and appearing like small islands.

Off Point Pedras are some rocky shoals, having channels between them and the main of 3 or 4 fathoms water. Hence the coast lies nearly west to the river Guamara, which is known by 2 inland sugar-

loaf mountains of unequal heights, and about 3 leagues farther west is Tubarao or Shark's Point. Nearly midway between Point Pedras and Shark's Point, are some red cliffs, off which lies the east end of *Salinas Bank*, which thence extends nearly parallel to the shore to a-breast of Shark's Point. It lies about 4 or 5 miles from shore, and the channel between has 4 fathoms water, but there are several banks lying therein, which makes the navigation difficult and dangerous, to those who are unacquainted therewith.

Tubarao or Shark's Point is on the east side of the river Amargoso, near which to the westward are 2 others: namely, the river Cavallos, and the river Conchas. North-westward from Tubarao Point about 3 leagues is Ponta do Mel, or Honey Point, known by some high red cliffs, and some palm or cocoa trees near the sea. Nearly N.W. $\frac{1}{2}$ W. 6 or 7 leagues farther is Cape Corso on the north side of the River Upamena, where there are some salt ponds; at the entrance, the depth is only 9 feet at high water, but within there are 8 fathoms. On the west side are some red cliffs. The water is shallow to a considerable distance from Cape Corso, and also from Honey Point.

Six or 7 leagues N.W. $\frac{1}{2}$ N. from Cape Corso is Agebarana Point; between is Itiobara Bay, to the eastward of which is a remarkable hill, called Red Mount. On the west side of Agebarana Point is *Porto das Oncas*, and about 5 leagues north-westward from it, is the river Jaguaripe, which may be known by a round bare hill of sand on its N.W. side, terminating in a rock below, and within land a mountain having 7 sugar-loaf points. To the northward of Agebarana Point are several rocks above and under water. About 3 leagues north-westward from Jaguaripe River, begins some dark coloured land, which thence extends about 4 leagues farther, having several openings like bays. About a mile from the first of these openings, there are some white cliffs appearing like a schooner under full sail, standing eastward. Westward of this bold land, the coast is more flat and level, and to the westward of this flat land a short distance, is the *Bay of Iguape* which forms a small harbour. This bay is surrounded by high perpendicular cliffs, against which, the sea breaks on high tides. There is good shelter in $2\frac{1}{2}$ or 3 fathoms, within a high round rock; there is an anchorage also on the N.W. side of it in 4 or 5 fathoms, but the latter is quite exposed. Here water may be obtained from pits in the strand. Near this rock of Iguape, on the east, the River Xaro empties itself into the sea; and to the westward of it, about 3 leagues from shore, is a bank of sand, with some small shells, on which the water appears greenish; the depth on it is 5, 6, and 7 fathoms.

About W.N.W. $\frac{1}{2}$ W. 6 or 7 leagues from Iguape is the bluff point of Macoripe; south-westward of which, is the fort or settlement of *Scara*, or St. Joze de Ribamar, in $3^{\circ} 30'$ south latitude, situated near a small streamlet, which in summer has very little water. Small vessels anchor opposite the fort, at about a musket-shot distance from a reef which appears at low water. Between this reef and the shore the ground is very bad, and unfit for anchorage.

Ships from Europe bound to Maranham should make the land

hereabout, they may then run along shore within a few leagues of the coast in sight of land, in 10 or 12 fathoms water; observing to make allowance for the operation of the tide, particularly when passing the mouths of the rivers, as the ebbs set strong to the north-eastward.

At the distance of $14\frac{1}{2}$ leagues N.W. by W. $\frac{1}{2}$ W. from Point Macoribe, is the point of Mount Melancias in $3^{\circ} 7'$ S. latitude, having on its east side the river Frecheiras, and $2\frac{1}{2}$ leagues to the westward of it the river Mondahu. There are other rivers between Seara and the point, but they are small and of no use; the coast is also skirted with rocks. Mount Melancias is very remarkable by being situated very near the point. N.W. by W. $\frac{3}{4}$ W. $7\frac{1}{2}$ leagues from the point of Mount Melancias, is the east point of an island, which thence extends 5 miles in the same direction, and has a shallow bank on its north side. It lies near the shore, and the two rivers Aricati Assu and Aricati Merim, disembogue themselves at its ends. Four leagues from the west end of the island in the same direction is the point on the east-side of the river Caracu, off which is a small spit of sand: an islet lies in the entrance of the river, off which is a small spit of sand also.

The coast hence lies W. by N. $9\frac{1}{2}$ leagues, to the east point of Jericoacoara Bay. This bay is covered with sea weed, and the shore is barren. It is full of shoals, having near the shore 2 fathoms, and a little farther out 4 fathoms. It is in latitude $2^{\circ} 44'$ south, and may be known by a high mountain a little inland, almost round, the ground breaking near it, and forming others of a little less height.

Between the river Mondahu and Jericoacoara Bay, a flat of 4 fathoms extends from shore upwards of 4 leagues, having 5 or 6 fathoms on its extremity, with red coral bottom: without it are 8 or 9 fathoms.

From Jericoacoara Bay the coast lies due west 22 leagues to the river Igarasu; between are the rivers Camosim, or Camussi, and Tamonia, with several smaller ones. On the east side of the entrance of the Igarasu, is the island Pedra do Sal; and about 8 miles north-westward from the Igarasu is the Barra Velha, or Old Bar, of the river Parahaiba, on which there are 4 fathoms at low water. The entrance is only 120 fathoms wide, but within it widens and forms a kind of a lake, with from 6 to 8 or 9 fathoms water. As you proceed upward, the Parahaiba joins the Igarasu, for they are both branches of the same river. The bar lies between two heads of sand, which extend a considerable distance from shore, and are covered at high water; the bottom of the bar is mud and red coral. The great bar lies farther westward, between an island which separates the old one from it and the main. W.N.W. $12\frac{1}{2}$ leagues from the Old Bar of Parahaiba, is the entrance of the river Perguicas. The coast between these places is easily known by being a tract of exceedingly white sand hills, without any heath or shrub whatever, called *Lancoes Pequenos*, or little white sand hills; and the sea-water off this part is of a very light blue colour. From the mouth of the Perguicas a ridge of sand extends to the N. by W. nearly 7 leagues. It has 8 fathoms on its extremity, and at the distance of 4 leagues from

shore only 4 fathoms, with a decreasing depth nearer to the land. It is from 2 to 3 miles wide, and there are from 8 to 10 and 17 fathoms on the east side of it; on the west side the water is not quite so deep. Vessels running along shore should haul off 4 or 5 leagues to the northward until they have passed it, and then in again towards the shore to any convenient depth.

On the west side of the river Perguicas begins the *Lancoes Grandes*, or tract of large white sand hills, similar to those before described, but larger; and the instant you arrive off them in sailing westward, the water changes from the light blue colour, before mentioned, to a green, so that the division of the colours takes place off the river Perguicas, and probably at the ridge that spits off from it. This tract extends about 12 leagues westward, the coast lying W. by N., and about 2 leagues short of its west extremity there is one sand hill larger than all the others.

The entrance of the river Perguicas is about a mile and a half wide, and has $4\frac{1}{2}$ or 5 fathoms water; but to enter it, it is necessary to keep close to the eastern point, to avoid the sand-bank which lies at its mouth. When you are within, you may anchor in 4 or 5 fathoms. There is also a passage on the west side, between the point and the bank, of about a mile in width, and from $2\frac{1}{2}$ to 3 fathoms in it.

Adjoining these sheets of sand to the westward, there are above 5 leagues of coast covered with green mangues, which, at a distance, have the appearance of a dark kind of brush-wood. Where these terminate is the river Marim, having three islands of green mangues at its mouth. Between these islands and the east point large ships may enter, the channel being one mile wide, and a depth of 7 or 8 fathoms; the other entrances have only one fathom. Between 2 and 3 miles northward from these three islands is a shoal-bank, on which the sea always breaks; it has 4 fathoms near it. About 2 miles west from the entrance of the Marim, is a low level island of dry mangues, and to the westward of it, distant about $\frac{3}{4}$ of a mile, is another island about $1\frac{1}{2}$ mile in length, called *Pria*, on both of which fresh water may be obtained from pits in the strand. A fort formerly stood on *Pria*. Nearly 4 miles W.N.W. from *Pria*, is the Isle of St. Anna, about 2 miles across each way, and surrounded by a shallow bank, a spit of which extends to N.E. by N. about 7 miles, having from 5 to 3 fathoms on it.

S.W. $\frac{1}{2}$ W. 5 leagues is Point de San Joze, the east extreme of Maranham island. Between is the entrance to the Bay of St. Joseph, which it is not safe to enter without a pilot. From Point St. Joseph to the N.W. extremity of the island it is 8 leagues. The *Coroa Grande*, or Great Crown, is a large bank extending nearly 18 miles north from Point St. Joseph; its eastern limit is 10 or 11 miles west from St. Anna, whence it extends about 18 miles to the westward, and terminates nearly north from Aracaji, a red cliff about 5 miles eastward of the N.W. point of Maranham. There are several navigable channels through this great bank, but they are little known. The channel which leads to the city lies between the *Coroa Grande*, and the coast of Tapitapera on the west, and is 7 or 8 miles wide,

with from 7 to 10 and 12 fathoms on sandy bottom, and having in it a shoal called *Baixa de Meia*, or Middle-bank. St. Luis of Maranham is in latitude $2^{\circ} 32'$ south, and longitude $44^{\circ} 22'$ west.

DIRECTIONS for sailing to ST. LUIS of MARANHAM.

Having passed along the coast from the eastward, in the depth of 10 or 12 fathoms, as before directed, be careful to make the small islands of *Mangues Secos*, and *Pria*, and also the island of *St. Anna*; then haul out N.W. if it be ebb tide, or a little more north if flood, to avoid the long spit of sand that stretches out from the latter island, until you get in the depth of 18 or 20 fathoms, and lose sight of *St. Anna* from the deck. Then steer west until you make the *Hill of Itaculumi*, keeping a good look-out on the larboard hand for the north head of the *Coroa Grande*, which always shews in detached breakers. This precaution is particularly necessary with flood tide and little wind; and if the tide sets you near it, you must steer more northerly to counteract its effects. When you have made the hill of *Itaculumi*, and brought it to bear west, at the distance of four leagues, you will be to the westward of the *Coroa Grande*, you may steer south into the bay, taking care to avoid the Middle-bank. As you proceed, the *Aracaji*, or high red cliff, will appear in sight a-head of you, which you may approach to the distance of 3 miles or less, in 9 or 10 fathoms water, and anchor with it bearing S. by E. or S.S.E. and send a boat for a pilot. It is high water on full and change days at three quarters past six o'clock.—Spring tides rise 19 or 20 feet.

Remark.—It has been before observed, that, off the tract of little white sand hills, the sea is of a light blue colour, and off great white sand hills it is green. In like manner, in the Bay of Maranham there may be seen some spots of muddy water, whilst in others it will be perfectly transparent: there will also be seen floating, a kind of fruit appearing like the rough outer coat of an European chesnut. These marks are not seen generally, more than 9 or 10 miles from *Tapitapera*; but during the winter or rainy season, from December to July, both the fruit and discoloured water are to be met with at a great distance from land.

The rainy season is also the best to approach the coast in, because there the land always appears clear and bright, and the winds are moderate; but August, September, October, and November, is the windy season, during which the land is constantly covered with a thick haze; particularly when it blows hard. The prevailing winds on this coast are the N.E., E.N.E. and east, all of which are fair to sail in and out with. Vessels may anchor any where on this coast by attending to the time of tide, in order to have sufficient depth of water.

From MARANHAM to BELEM or PARA.

The best time to leave Maranham is the morning, then pass to the eastward of the Middle-bank, and stand out north until you get the

depth of 15 to 18 fathoms, or until you have passed the shoals that lie off the Bay of Cuma, which may be effected by a run of 8 or 9 leagues, and making proper allowance for the stream of the tide. Then steer N. by W., or N. by W. $\frac{1}{2}$ W., and you will fall into 8, 7, and 6 fathoms, on a flat that extends 4 or 5 leagues from shore, and so far to the north-westward as I. de San Ioao, or St. John's Island.

The coast from the Bay of Cuma to St. John's island is all low and flat, with a few strands of white sand. Nine leagues N.N.W. from the former, is the Bay of Cabelo de Velha, from the north side of which some shoals extend to a considerable distance off: the coast hence lies about N.W. $\frac{1}{2}$ N. 9 leagues is St. John's island. When you have passed the shoals off the Bay of Cabelho de Velha, you may steer N.W. by N. and should you get less than 6 fathoms, you need not be alarmed; and when you get the increasing depth of 10 or 12 fathoms, you will be off the flat bank, and to the northward of St. John's island.

The *Island of St. John* lies N.E. and S.W., is about $3\frac{1}{2}$ leagues in length, and very low: it is about 2 miles from the main, and its N.E. point is in latitude $1^{\circ} 19' S.$; a vessel may anchor about 2 cables' length from its N.E. point, in 6 or 7 fathoms, and fresh water may be readily obtained from the lakes near the point.

A shallow bank lies about 18 leagues E. by N. from St. John's island, having 7 fathoms very near it, and at 2 miles from its S.W. end 20 fathoms; it is nearly 2 leagues in length.

The coast from the Island of St. John lies about 18 leagues W.N.W. to Serra Gurupi, and is divided with rivers and bays close to each other; the first of which is Turivaçu Bay, so wide at its mouth and the land so low, that one point cannot be seen from the other. The Serra Gurupi is a high hill, at a short distance inland, having near it another somewhat smaller and rounder. The coast here is low, level, and sandy, covered with a dark dusky brushwood; and from the point, some shoals, on which the sea breaks, extend from 2 to 3 leagues off: about 3 leagues farther westward, is the bar of Gurupi river.

From the point of Serra Gurupi to the Bay of Caytè, the coast lies west 13 or 14 leagues, but as the shoals extend a considerable distance from shore, it is not safe to approach it nearer than 3 leagues, at which distance there are 7 or 8 fathoms, on clear bottom. Besides the Gurupi, there are several rivers between; the coast of Caytè is known by some high mangues islands, and white sands along the shore.

From the Bay of Caytè to Mount Pirauçu is about 11 or 12 leagues west, a little northerly: between are the bays of Cotiperù and Meriguiãui, and several small rivers; and as the water is shallow, it is not safe to go nearer than the depth of 6 to 8 fathoms, which is about 6 or 7 miles from shore. The hill or mount of Pirauçu terminates in a high bluff perpendicular point, with red cliffs on the east part of it. Hence to Maracana is 13 or 14 leagues, nearly west; and between are the bays of Piramerini, Guarupipo, and Viranduba, or the Salt ponds. At the latter are several beaches of very white sand, and some projecting points on which the sea breaks, and ap-

pears at a distance like shoals. Here is also a *vigia*, or watch-tower, on which a signal is made at the approach of any vessel; at this spot there are two great cliffs of white sand. In the Bay of Maracana are 5 or 6 fathoms water.

BELEM OR GRAM PARA. West southerly about 8 leagues from Maracana is *Point Tigioca*, the east point of the mouth of the River, off which, to the north and N.W. lie the shoals of Tigioca, extending 6 or 7 leagues from the point, and having near their extremity 6 or 7 fathoms water; the sea breaks heavily on these shoals. There is a passage between them and Point Tigioca; but the depths are irregular, having, in some places, only 2 fathoms, and probably less at low water; at the narrowest part it is about half a mile wide. The principal channel lies to the northward and westward of these shoals, between them and the *Island Joanes*. To sail in here, it is necessary, when you are 2 or 3 leagues off to the northward of Maracana, to haul off N.W. or more northerly, according to the tide, until you are 8 or 9 leagues from it, then steer to the westward, taking care to go no nearer to the shoals than 8 or 7 fathoms. By keeping in that depth, you may steer W.S.W., S.W., S.S.W., &c. and pass between it and Point Maguari, from whence to the city of *Belem* or *Para*, it is about 24 leagues. The Island of Joanes is low, level land, and at a distance appears to be covered with a round, bushy, low shrub.

Should the approach of night render it necessary for a vessel to anchor, she may do it with safety in sight of, and at the distance of 3 or 4 leagues from, the Island of Joanes; and the best time to weigh anchor again is at low water, then run in by the east side of Joanes, and passing the shoals of Tigioca, keep nearest the east shore. The bar is a small narrow bank, lying across the channel, with 4 or 5 fathoms at low water on mud bottom. The land from Tigioca Point to a considerable distance in, is low, level, and black, and full of mangues, which at a distance appear like shipping at anchor: it should not be approached nearer than 5 or 6 miles. At the termination of this dark land, are two small beaches of white sand, and farther on some red cliffs. A league farther is a point of land, southward of which is the Bay do Sol, to the S.W. of which is the island of Morobira, separated from the land by a narrow channel; it has a village on its S.W. point. Off these places the water is shallow; should you get into $4\frac{1}{2}$ or 5 fathoms, edge off immediately towards Joanes, into the depth of 8, 10, or 11 fathoms. About 5 or 6 miles farther is the Bay of St. Antonio, on passing which, the city of Para will appear. There is a round island lying within sight of the city, and to the westward of it 3 or 4 smaller ones, one of which has a red cliff. To the northward of these islands is a shoal, which appears at low water; and to the southward of them, at a short distance, a long island, called the *Oncas*, with a fort on it, directly opposite the round island. The channel lies between the round island and the fort, and the anchorage is before the city, in 4 or 5 fathoms water.

There are an immense number of islands in this river, through which the channels are intricate and dangerous, and therefore should

never be attempted by any but those who are well acquainted, without a pilot.

From CAPE ST. ROQUE to CAPE FRIO.

CAPE ST. ROQUE, as before said, is the north-easternmost promontory of Brazil, in latitude $5^{\circ} 6'$ south, and longitude $35^{\circ} 40'$ W. The banks extend about 7 or 8 leagues to the northward of the cape, and have close to their east end 7 fathoms, and at the distance of 3 leagues 26 fathoms water.

RIO GRANDE. At the distance of 11 or 12 leagues, south-eastward of Cape St. Roque, is the entrance of Rio Grande, whose stream is very rapid. From the north point a reef stretches off a large musket shot, covered at high water. At the south point is a flat rock, on which stands the Fort dos Reys Magos, insulated at high water, whence a reef extends to a considerable distance seaward. The entrance lies between these reefs, and the anchorage is opposite the fort in $3\frac{1}{2}$ or 4 fathoms water, more than 2 miles below Natal. Without the reef which stretches off from the north point are some banks above water, extending southward above 2 miles.

Ponta Negra is about 4 leagues S.S.E. easterly from Fort dos Reys Magos; between, and at the distance of 3 miles from the former, is Pirangi. About $10\frac{1}{2}$ leagues S.S.E. ward from *Ponta Negra* is Porto Angaro, and thence 10 leagues S. by E. $\frac{1}{4}$ E. is Cape Ledo in latitude $6^{\circ} 40'$ S., and longitude $35^{\circ} 6'$ W. This cape forms the outer extreme of the land bounding *Paraiba* river, which is a place of considerable trade, having 15 feet on the bar at low water, and close without it 4, 5, 6, and 7 fathoms. On the south side of the entrance stands the fort of the Cabedello, or spit of sand.

Ships bound to *Paraiba* from Europe should make the land about Cape Blanco, which is 4 leagues farther southward, and may be known by some cliffs on its north side; and when they have made this cape, run northward without the reefs, until they get opposite the river, and then run in, taking care to keep the channel between the reefs. The city of *Paraiba* lies at a considerable distance up the river on the south side.

Between Cape St. Roque and Cape Ledo, the shore is lined with reefs, with soundings extending to a considerable distance off, but near the latter the bank is steeper, 12 fathoms being very near the shoals, and at three leagues off no bottom; so that great caution is necessary in approaching this coast in the night, as the reefs project 5 or 6 miles from shore.

About 7 leagues southward of Cape Ledo is *Porto dos Francezes*, Frenchman's harbour, in which is anchorage for 10 or 12 ships, on indifferent ground. It is surrounded by cliffs 40 or 50 feet high, close to the beach, by which it may be readily known. Eight leagues farther southward is Point Pedra, and $2\frac{1}{2}$ leagues farther is the bar of *Catuama*, at the north end of *Itamaraca* island, which admits nothing but small craft.

ITAMARACA. The town of *Itamaraca* is situate at the south end

of the island of the same name, and the entrance of the harbour is between it and the main on the south side about a musket shot wide; the bar has 15 feet water at low spring tides, and these tides rise 9 feet. Immediately within the bar the water deepens to 18 feet, and at the anchoring place, which is about 3 miles farther, still deeper, and perfectly sheltered from all winds. It is necessary to observe that, as the entrance is narrow, a fair wind is requisite, as there is no room for tacking.

Six or seven miles farther southward is the bar of *Pao Amarello*, which will admit ships of considerable burden; but as the deep water channel is narrow and long, so that ships are obliged to lie with one anchor on the reef and the other on the shore, to prevent them from swinging with the tide, it is considered unsafe.

The *Point of Olinda* lies about 10 miles farther southward; between is the rivers *Dolce* and *Tapado*, of no importance. Reefs and shoal water extend $1\frac{1}{2}$ mile from the point, and must be carefully avoided: approach no nearer than in the depth of 7 fathoms. The city of *Olinda* is on the ascent of a hill, and on its summit is a large building, which may be seen at a considerable distance.

Pernambuco is a well fortified town, lying in latitude $8^{\circ} 4'$ S. and longitude $34^{\circ} 52'$ W. The following directions for its harbour are by Mr. John Harris, master of *H. M. S. Porcupine*:—

“*Pernambuco* harbour is inside a ridge of sand and rocks, on which a mole has been built and guns placed for securing ships, which lie here in perfect safety moored in tiers, about 100 yards from the shore, in from 17 to 13 feet water, soft mud. But ships drawing more than 14 feet water cannot load inside, on account of a bar, which extends across from the north end of the mole to the shore, with no more than 14 feet water on it. Large ships lie in safety about half a mile to the northward of the entrance of the harbour, at about 2 cables' length from shore, with the harbour's mouth open. Here they moor all fours with 2 anchors to seaward, and complete their cargoes. On the full and change of the moon it generally blows fresh, and sends a sea in, but it seldom blows home to the ships, or lasts more than 4 or 5 hours.

“Ships running in for the harbour without a pilot should take care not to open the citadel to the northward of the round tower, on the north end of the mole; but bring them on with each other, and proceed in that direction until the fort, which stands on the beach to the northward, bears N.W. by W. Then bring the two turrets on the south part of the citadel in one, and run in that direction until the harbour is open; then anchor, and warp in.

“A sunken rock lies at about a quarter of a cable's length from the round tower on the mole.

“The outer road is not so good, as there are several patches of foul ground, and a great many anchors in it. The best anchorage in it is, with the round tower and citadel in one, and the highest house at *Olinda* about north, or north a little easterly.

“The *Englishman's shoal* is a dangerous bank of hard concreted stone and shells, on which several ships have knocked their rudders

off. It lies with the highest house at Olinda, bearing N. $\frac{1}{2}$ E. and the round tower S.W. by W. westerly.

“ A pilot may be obtained by making the usual signal.”

This is a place of great trade, being the port of the city of Olinda. *Cape St. Augustin* in latitude $8^{\circ} 22'$ S. and longitude $34^{\circ} 53' 30''$ W. is formed of a ridge of high land projecting into the sea, with the fort N.S. de Nazareth on the summit of the hill over the cape. It is about 6 leagues to the southward of Pernambuco, and may readily be known by the view in the Chart. The coast between these places may be approached by the lead.

From Cape St. Augustin the coast takes a direction to the westward of south, and at the distance of 7 leagues is the *Island of St. Aleixo*, having a passage between it and the main $1\frac{1}{2}$ mile in breadth, with a depth of 4 or 5 fathoms, but as there is a rock near the island it is not safe to anchor there. A ship may anchor to the southward of the island in 5 fathoms, quite exposed.

About 17 miles S.S.W. ward from St. Aleixo island is *Tamandary bay*, said to be the best on this part of the coast, capable of containing a large fleet in perfect security. The entrance is between the reefs, with which the coast is skirted, and has a depth of 6 fathoms: within there are 4 or 5 fathoms, on clear ground. This bay is well defended by batteries. Those who are not acquainted should not attempt this place without a pilot, as it has no distinguishing mark by which it may be known, and the reefs are very numerous, some above, others under water, and in some places full 3 miles from shore.

Eleven leagues south-westward from Tamandary bay is *Porto Calvo*, capable of containing 5 or 6 vessels of 150 tons burden, in a depth of 3 to $3\frac{1}{2}$ fathoms on clear ground. The entrance to this port, as well as the others on this coast, is also between the reefs, which lie $1\frac{1}{2}$ or 2 miles from shore: the depth in the entrance is 5 fathoms. *The Alagoas* have shallow water and will admit nothing but small craft.

Nearly 11 leagues S.S.W. ward from the Alagoas in latitude $10^{\circ} 25'$ S. is the *River Coraipa*, capable of admitting boats only; and opposite this river at nearly 3 miles from shore is *Diego Rodrigues bank*, extending along shore 5 or 6 miles, above water in many places: large ships may pass within it. There are also other banks lying farther off south-eastward, called the *Reefs of St. Francisco*, which must be cautiously avoided, when sailing along shore by night. If a large ship fall in with the land, about Cape Ledo or Cape St. Augustin, she should not approach it into a less depth than 25 or 20 fathoms in proceeding southward; she will then avoid all the dangers along the coast, as these depths are without the stream of the reefs and banks; those of St. Francisco excepted.

The *River St. Francisco* is wide, and the stream of ebb is rapid; and although it is apparently of some note, none but small craft can go over the bar, formed by the sand-banks at its mouth. *Sergipe* and *Rio Real* are similar, and incapable of admitting any but small craft. The coast from Passaros Isle to Sergipe forms *Vazaharis Bay*, where there is always a heavy sea, but particularly when the wind blows directly on the coast.

Nearly S.W. by S. 37 leagues from *Rio Real*, is *Point St. Antonio*, or Cape St. Salvador, at the entrance of the Bay of all Saints; between, is the river Tapicura, capable of admitting small craft only.

The BAY OF ALL SAINTS, called also Bahia, or the harbour of St. Salvador, is an extensive bason, with several islands in it, which receives the tribute of six large rivers: the entrance being between the peninsula on which the city of St. Salvador is built on the east, and the Island Taparica on the west.

The entrance of this harbour was surveyed, in 1813, by Mr. John Warner, Master of H.M.S. Nereus, under the direction of Capt. P. Heywood; a plan of which is inserted in the general chart; and the following is his description of and directions for navigating in it.

“*Bahia, or St. Salvador.* The entrance of this spacious bay or harbour is formed by the Island Taparica on the west, and Point St. Antonio on the east; the distance across is about 7 miles, and the soundings very irregular. There are 14 to 16 fathoms within half a mile of the eastern shore, whence it deepens to 18 or 20 fathoms in a westerly direction, until about two thirds across, (which is so far as heavy ships ought to stand.) To the westward of this are overfalls, shoaling from 14 to $6\frac{1}{2}$ fathoms, then deepening again to 12; and in some places, at the distance of $2\frac{1}{2}$ miles from Taparica, there are no more than 3 fathoms.

“Off the east point of Taparica, which bears N. 83° W. $7\frac{1}{4}$ miles from the centre of the city, there are vast reefs of rocks, extending about $1\frac{1}{2}$ mile from shore; and about a cable's length without them are 6 fathoms; it thence deepens quickly to 12, 18, 24, and 26, soft muddy bottom; and about midway across, had some casts of the lead without getting bottom at 26 fathoms. From this, in an easterly direction, the depth gradually decreases to 12 fathoms, at 1 or $1\frac{1}{4}$ mile from Fort Island, which is situated before the town.

“There is a spot of very foul ground about a mile in length, nearly north and south, and half a mile broad; the centre of which lies about W.N.W. $\frac{3}{4}$ W. three quarters of a mile from Fort Island. It has on some parts only $3\frac{1}{2}$ fathoms, at $\frac{3}{4}$ ebb; on other parts 10 fathoms, rocky bottom. H.M.S. Nereus moored upon it in seven fathoms, (being then unacquainted) with Fort Island bearing east. Fort Cabo S. 5° W., and Monserate fort N, 15° E. by compass, and had her cables much injured.

“There is good anchorage all around this shoal: between it and Fort Island, in 7 or 8 fathoms; without it, in 12 or 14 fathoms; above it in 8 or 9 fathoms, and below it in the same depth, on good ground. Small vessels generally lie between Fort Island and the city.

“The best anchorage for ships of war, is in 10 or 12 fathoms, with Fort Island bearing S. 73° E. and Monserate Fort N. 28° E. which is about $1\frac{1}{2}$ mile from the city; from this spot they will be able to get clear out with the *very* light morning winds, as the ebb tides set strong in towards Forts Cabo and St. Antonio.

“The watering place is at a short distance to the southward of the town, and near it is Fort St. Pedro, off which a shoal extends

nearly half a mile, on which H.M.S. *Bonne Citoyenne* grounded in 1812: it has only 10 feet on it at 3 cables length from shore, hard sandy bottom. The bastions of Fort Cabo kept just open of the slope of the hill, on which stands a convent with a double spire, will lead across the tail of the shoal in 5 fathoms water.

“ On Point St. Antonio is a fort and light-house, whose lantern is elevated about 120 feet above the level of the sea. By an observation made within 60 yards of the fort, the latitude was $13^{\circ} 2' 46''$ S. and the longitude, by chronometers, from Rio Janeiro, in 14 days, $38^{\circ} 29'$ W. allowing Rat-island, in Rio Janeiro, to be in $43^{\circ} 0'$ W. of Greenwich.

“ From this point a sandy shoal extends in a southerly direction $5\frac{1}{2}$ miles, having no more than $3\frac{1}{2}$ and 4 fathoms on it; but, at the distance of 6 or $6\frac{1}{2}$ miles, it may be rounded in 8 or 10 fathoms. Therefore large ships, coming from the northward, should keep at that distance from the point, until the light-house comes on with the double spired convent on the hill, bearing N. 8° E., or until *Monserate Point* comes open of *Fort Cabo*; then steer for it, giving the latter a berth of 3 cables length, and proceed up the harbour.

“ There is a channel between the point and the shoal, generally frequented by small vessels, which there was no opportunity of examining.

“ On full and change days the tide flows till $\frac{1}{2}$ past 3 o'clock, and rises perpendicularly about 9 feet.

“ To the north-eastward of Point St. Antonio, in 1813, were 4 signal stations, apparently, nearly at equal distances: the first or southernmost stood on the summit of a grassy rising ground; the second on a barren sand hill, in latitude $12^{\circ} 53'$ at the distance of $10\frac{1}{2}$ miles eastward from Point St. Antonio; between this and the third, which stands on a hill covered with verdure, is a very remarkable clump of tall trees; the fourth or northernmost, which is in latitude $12^{\circ} 45'$ S. and $20' 30''$ of longitude east from Point St. Antonio, stands on the northernmost part of a highish bushy level of the land: between it and the third, is a remarkable single tree.

“ Note. In latitude $12^{\circ} 0'$ S. there are 22 fathoms, sand and coral, at the distance of 6 or 7 miles from the land; but farther southward, in $12^{\circ} 30'$ there is no bottom at 60 fathoms, 8 miles off, and in latitude $13^{\circ} 0'$ at 12 miles off, there is no bottom at 100 fathoms.”

It has been observed, that on the coast of Brazil, the winds are periodical, blowing from S.S.E. and S.E. from March to September, the current then running northward; and from September to March, blowing from N.E. and E.N.E. with a southerly current. Vessels should therefore make the land to windward of the port, that they intend to touch at. Those bound to Bahia during the N.E. winds should make the land in or about latitude $12^{\circ} 0'$ it being thereabout very remarkable, by banks of white sand, which extend thence to the southward nearly so far as Praya de Zumba. Before the white sand patches are lost sight of, the Island of Tapame will appear close to the main, off which is some foul ground, to which a good

berth must be given; therefore edge off to the southward to clear the bank off Point St. Antonio, and when Monserate point comes open, run in as before directed.

This port is sometimes visited by outward bound East India ships in want of refreshments, but navigators are generally cautious of touching here, because its situation being in the middle of the S.E. trade, they think it difficult to get to the southward afterward, on account of adverse winds, said to blow along this coast from March to September; but those who have put in here, have never found any difficulty in getting to the southward, even in the most unfavourable months, June, July, and August, for the wind generally veers well to the eastward here, and more so farther southward.

OS ILHEOS or the islands, lie 37 leagues S. by W. $\frac{1}{2}$ W. from Point, St. Antonio, in latitude $14^{\circ} 48'$ S. These two islands appear at a distance like cardinal's hats: one of them covered with trees, the other without any; and they are about 4 or 5 miles from the main land. A reef of rocks extends southward from the southernmost, over which the sea always breaks. The entrance is between the northernmost island and the main, and the anchorage is about two thirds from Green Island, and one third from the main, in 7 or 8 fathoms water, mud. Within these islands is the mouth of the river Os Ilheos, having on its bar little more than 2 fathoms; but within in some parts there are 3 fathoms. Immediately within the entrance on a projecting point at the north side, stands the town of St. George, off which a spit of sand projects, and on the south side is a village. This river is known from sea by a round hill on the south side, having the appearance of an island, and by a high land close to the north side of the entrance, named Focinho do Cáo, the Dog's nose, having at its base some rocks, over which the sea breaks.

The land between St. Salvador and Os Ilheos is known by the Morro de St. Paulo, in latitude $13^{\circ} 30'$ S. which is very remarkable. In latitude $14^{\circ} 2'$ S. begins the land of Camamu, covered with mangues to a considerable distance southward, where the land becomes high and continues so to Rio das Contas, where it terminates. At the south point of the river is a remarkable white rock.

PORTO SEGURO is a place of considerable trade, but will not admit large ships, and the outside road is foul ground. There are several islands and shoals to the north-eastward of the rivers mouth, which must be left to the northward in proceeding to the road; therefore those who are unacquainted should take a pilot.

The ABROLHOS, or BRAZIL SHOALS. Twelve leagues to the eastward of Point Agusipa is the north-easternmost of the *Abrolhos islands*, named Monte de Pedras: they are four in number; the north-westernmost is named Seca; the south-westernmost St. Barbara, and the south-easternmost I. dos Passaros, or Birds Isle. These have neither wood nor water on them. Three leagues to the east and south-eastward of these islands the bottom is all rocky, some of which may be seen at low tides, although there are 15 fathoms close to them.

To the westward of them, there is a channel, said to be 5 leagues

wide, with 9 to 14 fathoms water, sand and mud; through which large ships may pass; but it is seldom used, by any but coasters.

The west side of this channel is bounded by shoals, and rocks above water, called, by the Portuguese, *Chapeiroens*, from their resemblance to large hats; and by the Dutch, the *Jesuits*. There is also said to be a channel for small vessels between these rocks and shoals, and *Point Agusipa*.

The *Abrolhos Bank* extends between 50 and 60 leagues from the coast at *Point Abrolhos*. The soundings on it are very irregular from 12 to 50 or 60 fathoms. It does not appear to be a continued bank, but probably is formed of several detached parts, with deep water between them, as soundings have been obtained by many ships far out on the bank, when others between them and the coast found no bottom, with 100 fathoms of line. Upon this outer bank of *Abrolhos*, above 3 leagues to the eastward of the islands, there is no danger, and it is a guide for ships approaching the coast, notwithstanding the irregularity of the depths on it.

Rio Doce is in latitude $19^{\circ} 34'$ S. whose stream is so rapid, that it discolours the sea 4 or 5 miles off: it admits nothing but small craft. South-eastward of its entrance are three small islets, named the *Three Brothers*, and another named *Reposo*; between the former and the shore there is anchorage. *Monte Reys Magos* is here remarkable on the north side of the river of the same name; and still farther southward in latitude 20° is a high round hill near the sea, called the hill of *Mestre Alvaro*, which terminates to the southward in a rocky point, named *Tubarao* or *Shark's Point*.

ESPIRITO SANTO. The bay of *Espirito Santo*, though narrow, is capable of containing large ships, having 6 to 8 fathoms in the entrance, and 5 fathoms within. On the south point of the entrance is a bare cliff or rock, named *Monte Moreno*, off which is a shoal that must be left on the south side; passing which you steer for an island that lies farther in, and when it bears between N. and N.W. you may anchor in good clear ground. This bay should not be attempted without a pilot.

From the entrance of *Espirito Santo* the coast trends more to the S.W. and at the distance of 37 leagues is *Cape St. Thomas*. There are several rivers between, and some small islets near the shore, but none of any importance. There are also several hills, one of which is very high and craggy, near the river *Garopari*, and to the northward of this another named *Pero Cao*. The saddle mountain, between the rivers *Iritiba* and *Tapoano*, is also very remarkable.

Cape St. Thomas, (*St. Thome*,) has, lying to the E.S.E. ward of it, an extensive shoal, which requires great care to avoid: its exact extent is not known, but, from its outer extremity, the land cannot be seen: there is a channel between it and the cape. To the south-westward of *Cape St. Thomas*, at the distance of 18 leagues, lie the three *Isles of St. Anne*, in the bay of the same name, about a league from shore, affording shelter and good anchorage under them; and fresh water may be procured at a village to the northward of them, in *Formosa Bay*.

CAPE FRIO, in latitude $23^{\circ} 1' S.$ and longitude $41^{\circ} 59' W.$ is formed by an island, and lies about 13 leagues from St. Anne's Isles. The harbour or port of Cape Frio is formed by the Cape Island, and has water sufficient for the largest ships: the entrance is at the east end, and is nearly one third of a mile wide on the south side of Ilha dos Porcos. There is also a passage at the west end, but it will admit nothing but boats. Here a few ships may lie in perfect security, and fresh water may be obtained from wells either on the island or the main. On full and change days it is high water at 9 o'clock, and spring tides rise 4 feet 6 inches.

From CAPE FRIO to CAPE ST. MARY.

Cape Frio from the eastward appears like two paps or hummocks, and close to it on the N.E. side lie several small isles, which like the Cape Island have deep water close to them. The land about the cape is of moderate height, and appears at a distance like islands; the land to the northward of it is higher. Ships from the northward and eastward, bound for Rio Janeiro, generally steer to make Cape Frio, and they must be very careful in the night not to run in to the northward of it, with easterly or S.E. winds, which has happened to several by mistaking the latitude of the cape, and nearly proved fatal to them.

RIO JANEIRO. The entrance of Rio Janeiro lies about $18\frac{1}{2}$ leagues to the westward of Cape Frio. In steering from the cape westward towards Rio Janeiro, it is best to keep 3 or 4 leagues off shore, and when at the distance of 9 or 10 leagues to the westward of the cape, if the weather be clear, the sugar-loaf will appear in sight, and soon after Redondo, or Round Island, bearing about west, and appearing like a small hummock. Shortly afterwards the extremity of the land to the westward will appear; and as you proceed you will soon see Raza, or Flat Island, and will pass the two Marica islands, small and low, and situated at the distance of $3\frac{1}{2}$ leagues to the eastward of the entrance of the harbour.

This harbour is one of the finest in the world; and Rio Janeiro city, called also St. Sebastian, is the capital of all Brazil, and the residence of the viceroy, since the removal of the palace from St. Salvador; he is stiled captain general of land and sea forces. In November 1807, the Prince Regent and Braganza family departed from Lisbon for this place, with the chief part of the Portuguese navy; since which it has been the seat of the Portuguese government. The city is situated on the west side of the bay immediately within the entrance, on a sandy plain, about 6 miles long and 4 miles wide, between the mountains. The entrance is known by the remarkable hill on the west side, named the Sugar-loaf, (before mentioned,) which may be seen at the distance of 10 leagues, leaning a little to the S.W. and is the only one among the numerous peaks on this coast that leans in that direction: also by the Island Redondo, which is high and round like a hay-stack, lying before the entrance, in lati-

tude $23^{\circ} 3' S.$ and longitude $43^{\circ} 0' 40'' W.$ and bearing $S. \frac{3}{4} W.$ from the Sugar-loaf, distant about $7\frac{1}{4}$ miles.

A rocky ledge extends nearly $1\frac{1}{2}$ mile S.W. from Redonda, on which a brig was wrecked in 1813.

Raza Island is low, but has a kind of small peak, resembling a slipper, when it is seen bearing westward. It lies $2\frac{1}{4}$ miles E.N.E. $\frac{1}{2}$ E. from Redonda, and $6\frac{1}{2}$ miles S. by E. from the Sugar-loaf. The soundings are 27 and 30 fathoms near these islands, on the outside and to the eastward of them. The I. do Puij lies $5\frac{1}{2}$ miles N.N. E. $\frac{1}{2}$ E. from Raza, and $4\frac{1}{4}$ miles E.S.E. from the Sugar loaf. Mayo lies about a mile farther E.N.E. The soundings between Puij and Raza are from 17 to 22 fathoms: there is also a good channel between Raza and Redonda. Another small islet lies within Mayo, near Point Taipu, but it is so near the shore that it is not always perceived.

The great channel leading to the harbour is between I. do Puij on the east, and Raza on the west side. On a near approach to these islands the entrance of the harbour will be perceived, formed by the Sugar-loaf to the westward, and Santa Cruz point to the eastward, on which is a fort, which, with the fort St. John, a little above the Sugar-loaf, commands the entrance. When the Sugar-loaf comes open to the westward of Puij, steer direct for it; and if you are apprehensive that the wind will not carry you fairly into the harbour, anchor about $\frac{1}{2}$ or $\frac{3}{4}$ of a mile S.E. of Cotunduba isle, in 10 or 12 fathoms water. It is imprudent to go farther in, because the swell on the bar will make you roll very heavy; and the bottom being rocky between the Sugar loaf and Santa Cruz, where the channel is not a mile wide, together with the strength of the tide, which rushes through at the rate of 6 or 7 miles an hour on springs, renders it very unsafe for anchoring. Several ships, at different times, have been nearly lost, by anchoring there.

The sea breeze, which generally sets in every day between 10 and 12 o'clock, and lasts until about sun set, makes it easy for any ship to run in; and the channel grows wider as you approach the town: but it is to be observed, that it is frequently full two hours after the commencement of the sea breezes before it reaches up to the town. Therefore it is necessary to wait a little before you run in, lest you should get becalmed in the narrow part of the channel. It is also dangerous to enter between the Sugar-loaf and Santa Cruz point with an ebb tide, and the sea breeze far expended, for the reasons before stated.

In proceeding for the harbour, if you do not get a pilot outside, keep nearer to Santa Cruz point than to the Sugar-loaf in passing between them; and when you are within the former you will have passed all hidden danger, and the course up the harbour is about N. by W. $\frac{1}{2}$ W. Stand on without fear for the anchorage abreast of the city, and anchor in about 17 fathoms water, on mud and sand, with the principal church in one, with I. Ratos or Rat I. bearing S.W. $\frac{3}{4}$ W. and the flag-staff in Villegagnon fort or with the Sugar-loaf. This is a most convenient berth for watering, &c. Some ships pass round the Isle

Cobras and anchor above it, before the Benedictine monastery, at the north-west end of the city.

The inner harbour is within the islands Cobras and Emaxados, or Hatchet island. On the N.W. side of the former there is a most convenient place to heave down ships of any size.

If the breeze is light and flattering, so soon as you pass Santa Cruz fort, haul up to the eastward, because the ground is tolerably good on this side, in case you should be obliged to anchor short.

You should moor as soon as possible, because the tides being much influenced by the winds, and the latter so variable, that it is very difficult to keep a clear anchor 24 hours. It is high water on full and change days of the moon, at half an hour after four o'clock; the flood generally runs $4\frac{1}{4}$ hours, and the ebb $7\frac{3}{4}$ hours, with little or no slack water; at the anchorage it runs at the rate of $3\frac{1}{2}$ or 4 knots. During heavy rains, the stream of flood is scarcely perceptible, and the ebb runs with increased velocity. The rise and fall of the tide is inconsiderable.

Fresh water is conveyed in pipes to the jetty, where boats lie and fill their casks with ease. Mutton is scarcely to be procured; hogs and poultry are dear; but indifferent beef, garden stuff, and fruit, may be obtained in abundance.

When a ship arrives here, a boat with an officer must be sent to Fort Santa Cruz, to be thence conducted to the Viceroy's palace, to state such arrival and the occasion of it. Sometimes the harbour-master comes on board off Santa Cruz, takes charge of and conducts the vessel into the harbour. The ship's colours must be hoisted, unless the pratique boat is already along-side. Sometimes the chief mate is taken out to be examined, but the captain must not leave the ship, until the police officers have ascertained the health of the crew, from whence the ship comes, whither bound, the proposed stay, and the object of the voyage. And here it may not be considered out of place to remark, that a ship, intending to stop only a few days, should apply for a much longer time, as some of the governors have been known to refuse strangers sufficient time to repair, and refresh their ship's crews.

A declaration of submission to the laws of the country, and other ceremonies, are passed through, before leave is given for any commercial intercourse between the ship and the shore. No seaman is allowed to land but at the stairs opposite the palace; nor can any officers or others, who are strangers, be permitted to perambulate the city or its environs without being accompanied by a military person, according to rank; officers with officers, and common men with soldiers or sailors.

When outward bound, if the wind is steady, steer direct for Santa Cruz point; but if the wind is light edge over to the eastward so soon as you can, until Santa Cruz bears about S.S.E. $\frac{1}{2}$ E. because, you will then be in the fair way of the tide, which will set you right out, whereas, if you were farther westward, it might horse you upon Square Island, which consists of some rocks with a fort on them.

If, from the wind failing, you should be obliged to anchor, go no

farther out than to bring Villegagnon flag-staff in one with the peak at the back of the town, bearing about W.S.W. $\frac{1}{4}$ W. and Square Island-fort on with the west end of Cotunduba Island, where there are 14 fathoms, mud and sand. This anchorage is about midway between Villegagnon fort and the eastern shore: farther out, the ground is rocky. The bar is about one third or half a mile without Santa Cruz point, and is about half a mile in breadth; the least water on it, at low spring ebbs, is about $6\frac{1}{2}$ or $6\frac{3}{4}$ fathoms, and the depth increases gradually on both sides. There are some sunken rocks at a short distance from Santa Cruz point, and, also, some at a short distance from the opposite shore; these are the only hidden dangers. Ilha Ratos, or Rat Island is in latitude $22^{\circ} 52'$ S. and longitude $43^{\circ} 0'$ W. by mean of several lunars and chronometers.

Rio Janeiro is frequented by ships of war, and others bound to India, for obtaining needful supplies; but, unless they are in real want of water or other necessaries, it does not appear advisable for them to touch here, or at any other port on the coast of Brazil, as it must considerably lengthen the passage to India.

ILHA GRANDE is about $4\frac{1}{2}$ leagues in length; its S.E. point in latitude $23^{\circ} 17'$ S. is about 20 leagues to the westward of Rio Janeiro entrance. The whole of the channel between the island and the main, is a spacious and safe harbour for ships of any size and number, with soundings from 6 to 14 fathoms. The eastern entrance, about 6 miles wide, is between Castelhanos Point and the west end of the Island Marambaya: at the latter place fresh water may be procured, and wood may be got on the adjacent islands; refreshments may also be got at the village d'Angra dos Reis, on the main, nearly opposite the west-end of Ilha Grande. There are several safe bays on that side of Ilha Grande which faces the land, capable of admitting ships of any burthen. The first of these from the east is Palmos Bay, where a ship may lay entirely land-locked in 6 to 8 fathoms water; the next is Albroo Bay, and to the westward of it, Eschella Bay, in both of which there are from 5 to 7 fathoms water. Two or three miles to the southward of Ilha Grande is the little island George Gregos, where there is not only anchorage, but plenty of wood and water.

Tubaroes Bay within, to the N.W. of I. dos Porcos, has good clean ground, and is capable of admitting ships of burthen: the entrance is about one mile wide on a depth of 8 fathoms.

ISLAND ST. SEBASTIAN lies about 44 leagues W.S.W. ward from the entrance of Rio Janeiro; its S.E. point is situated in latitude $23^{\circ} 49'$ S. and longitude $45^{\circ} 9' 30''$ W. The channel between this island and the main forms a safe harbour. A shoal bank stretches off from the main land, therefore it is necessary to keep nearest to the island. Captain Peter Heywood in the Nereus frigate passed through this channel in 1810; and during a stay of two days, Mr. John Warner the master, under Captain Heywood's direction, made a survey of the passage, to which the reader is referred. Refreshments may be obtained at the villages on the island, or at those on the main. The longitude of Ville Belle chapel by chronometers is $45^{\circ} 19' 15''$ W.

There appeared no regular set, or rise and fall of tide: but the current, dependent on the wind, sets northward with southerly winds, and the contrary with northerly.

SANTOS BAY, in latitude $24^{\circ} 2'$ South, lying 73 leagues to the westward of Rio Janeiro, and 24 leagues to the westward of St. Sebastian, affords safe anchorage in 5 or 6 fathoms water, sheltered from all winds but those from the S.E. to the S.W. The entrance is about three miles across from Point Groça to Point Taypu, and the depth is 7 to 8 fathoms; there is a sandy beach at the north part. The town of Santos is 6 or 7 miles up from the N.E. part of the bay; and the entrance is about one third of a mile wide between the forts of Barra Grande and Trinxeira: the depth here is 14 fathoms, and the course about E.N.E. to abreast of the first point on the west side, off which a flat extends half way across, which is avoided by keeping nearest to the eastern shore. The river now winds to N.N.W. and N. to the point next east from Santos, and then westerly $1\frac{1}{2}$ mile to abreast of the town, off which you may anchor in 6 or 7 fathoms, at one-fourth or one-third of a mile from shore. The bar of St. Vicente in the N.W. part of the bay, has 4 fathoms at its entrance, but is fit only for very small craft.

Between St. Sebastian and Santos Bay in latitude $24^{\circ} 9'$ S. lies the I. dos Alcatrazes, having foul ground about it: it is about $6\frac{1}{2}$ leagues S. S.W. ward from Toquetoque Point. To the northward of it, and about two leagues from shore, is another islet, named Monte Trigo: there are also some others farther to the eastward near St. Sebastian. *Isle Redonda*, or Round Isle, in latitude $24^{\circ} 31'$ S. and 6 leagues off shore, has a reef a little inside of it, extending about 4 miles parallel to the coast: to avoid which, ships that happen to get to the westward of Redonda, should not bring it so far east as E. by N. for, with it bearing E. $\frac{1}{2}$ N. a ship may be within half a mile of the reef.

From Isle Redonda to St. Catherines, there are several other small islands near the coast: there are also several small harbours. The first of these capable of admitting any thing larger than boats, is *Cananea* in latitude $25^{\circ} 3'$ S.; the entrance is to the southward of Ilha do Abrigo, and having $2\frac{3}{4}$ fathoms on the bar, is capable of admitting corvettes.

The next to the south-westward is the spacious bay of Paranaqua having three entrances. The middle mouth, lying between Ilha das Peças and Ilha do Mel, is the largest, and has most water; it is in latitude $25^{\circ} 31'$ S. To sail over the bar on which there are $2\frac{1}{2}$ fathoms at low water, bring and keep the S.W. part of Ilha das Peças, just touching the N.E. point of Ilha do Mel, and run in that direction until you get within a cables' length of the latter: give the point a berth in passing and run up by the north side of the island, at the distance of a cable's length from it. From the west end of Ilha do Mel to the west end of Ilha da Cotinga is nearly $7\frac{1}{2}$ miles west, a little southerly, the depth from 5 to $3\frac{1}{2}$ fathoms: you may there anchor in 2 or $3\frac{1}{2}$ fathoms as convenient, or go in to the southward off Paranaqua. Of the other entrances, that to the northward named the

Bar of Suparagui admits canoes only: that to the southward named Barra do Sul, (the south bar,) will admit small vessels, but it is never attempted unless from stress of weather.

The *Bar of Guaratuba* in latitude $25^{\circ} 51'$ S. is at the north end of a sand bank, and close to a large rock, where there are 6 or 8 fathoms water, and immediately within the rock, 4 fathoms increasing to 5 between the point of Guaratuba on the south, and the opposite point on the north side, distant about a quarter of a mile. From the entrance shoal water extends to a considerable distance south-eastward. The entrance is known by the *Morro Caiuva* on the north side. To sail in, from the north-eastward, being at a moderate distance from the land, steer direct for the Morro Caiuva, and on a near approach, midway between the Morro and the large rock to the southward of it; where there is water sufficient for the largest ships. There is good anchorage within the rock, under the Morro on the north side, in 4 fathoms. To proceed to Guaratuba, after you are within the two points of land, the course is about S.S.W. nearly a mile: there are $5\frac{1}{2}$ fathoms off the town. The tides in this river run with great velocity, whence it derives the name of rapid Guaratuba.

River St. Francisco, having an island of the same name lying at its mouth, disembogues at each end thereof. The northern entrance called Bepitanga in latitude $26^{\circ} 9'$ S., is capable of admitting large ships, the least depth therein being 6 fathoms. To sail in, steer towards the Morro do Joao Dias, at the north end of the island St. Francisco; pass it in 6 or 7 fathoms, and avoid a shoal spit that stretches off north-eastward from the opposite point of the main, by keeping closer to the south shore. When abreast of the point, the course will be south-westward towards the town, opposite which you may anchor; but be careful in sailing up of a bank named Pissarey, rather on the north side of the mid channel. This entrance is readily known by the elevated woody land of St. Francisco to the southward of it, terminating in the Morro or hill before mentioned, which is higher than the rest: and also by three small islets lying 2 or 3 miles south-eastward from the Morro. The other entrance to the southward named Araquari, admits very small craft only; but there are 3 islands about 2 miles off, under which vessels may anchor in 4 or 5 fathoms, and lie sheltered from the sea winds.

GAROPAS BAY is 5 or 6 miles in breadth, and has depth sufficient for the largest ships, where they may lie sheltered from all winds but those from north to east. The rivers Japiba and Piraguiguaru, discharge themselves into it, and the country around is covered with thick woods. The east point of the bay, named Ponta das Garopas, is in latitude $27^{\circ} 4\frac{1}{2}'$ S.

ISLAND ST. CATHARINE* is ten and one-third leagues in length, N. $\frac{3}{4}$ E. and S. $\frac{3}{4}$ W., and of various breadths from 8 to $2\frac{1}{2}$ miles: its north end is in latitude $27^{\circ} 19' 10''$ S. and its south end in $27^{\circ} 49'$.

* See the particular chart of the Island St. Catharine, published by W. Faden

The channel between this island and the main forms an excellent harbour for ships of every description. A little to the southward of the middle of the island, which in this part is separated from the main by a narrow channel of 180 fathoms, is the town of Nostra Senora del Desteiro, the capital of the government, and the residence of the governor, containing about 400 houses. From hence to the south end of the island, the channel will only admit small vessels out to sea.

Vessels may approach St. Catherine's island without difficulty. A muddy bottom is found at the distance of 18 leagues off, the depth gradually diminishing until within 4 cables' length of the land, where it is 4 fathoms. The usual passage for ships is between the north end of St. Catharines' and Arvoredo Island, distant about 5 miles to the northward; a ship may pass occasionally between this island, and the other small islands to the north-westward of it, but with this second passage it is necessary to be well acquainted. The best anchorage is at the distance of half a league from Fortress island, in 6 fathoms on a muddy bottom, with the citadel bearing S. $\frac{1}{4}$ W. and the fort on the great point S.E. by S. $\frac{1}{4}$ E. A ship lying here will be in the midst of watering places, which abound both on the island and the continent, and may choose that creek, which according to the wind may be easiest of access. This consideration is of great importance, as the navigation of long boats is difficult in the channel, which to the narrow passage opposite the town is 2 leagues wide: the sea has a strong swell, and always breaks on the lee shore. The tides are extremely irregular: the flood enters at both ends of the island, and proceeds as far as the narrow passage, but never rises more than 3 feet. The variation of the compass was $7^{\circ} 50'$ E. in 1803.

Here ships get well supplied with fruits, vegetables, and refreshments of various kinds; but the prices are not very low.

Ships may anchor in the Bay of Tijucas, if necessary, in from 7 to 14 fathoms water.

There are several islets near the shores of St. Catharine; and there is from 10 to 16 fathoms water near those off the south entrance: at the distance of 10 or 12 leagues off, there are from 60 to 70 fathoms. Although there are no soundings marked, between Rio Janeiro and Rio de la Plata, in any of the charts hitherto published, yet, on every part of this coast, soundings may be obtained at a considerable distance off.

From the south end of St. Catharine's island, the coast lies S. by E. easterly 11 leagues to a projecting point with a hill on it, called the *Morro do Batuba*: between, nearly at equal distances, are three other lesser hills. From the *Morro do Batuba*, about 7 leagues south a little easterly, is the entrance of the Laguna de St. Antonio, which extends thence N. by W. about 7 leagues, and 6 or 7 miles southward: the town of St. Antonio de Laguna stands on the north side of the entrance. Between the *Morro do Batuba*, and the bar at the entrance of the Laguna, at the distance of 3 or 4 miles from shore, are the Islands *Tacami*, *das Araras*, and *dos Lobos*.

Four leagues about S. by W. from the entrance of the Laguna, is the point and hill of St. Martha, (Morro de Santa Marta Grande;) about midway is the little hill of St. Martha. From the Point of St. Martha, the coast bends to W.S.W. $\frac{1}{2}$ W. 9 leagues to the river Ararangua, and thence S.S.W. 14 leagues to Point Hapeba. Between the latter two, are the rivers Os Conventos, Laguintias, and Mambituba, and the hill called As Torres. Five leagues farther on the same bearing is the entrance of Taramandi Lagoon. The coast hence runs S.W. $\frac{1}{2}$ S. 44 leagues, and S.W. by W. 16 leagues, to the mouth of Rio Grande de San Pedro, in latitude $32^{\circ} 10'$ south, The sea coast hereabout is remarkably low and sandy, and may be approached by the lead. There is a bar across the entrance of this river, with 15 feet water on it; close within it there are 5 fathoms, and at the distance of 4 or 5 miles farther up 6 and 7 fathoms, on a muddy bottom. This is the entrance to two spacious lakes, one of which, lying to the north-eastward denominated *Lagoa dos Patos*, is 40 leagues in length, and about 10 leagues wide. The other lies to the southward through a narrow strait, is called *Lagoa de Miri*, and extends to the westward of the *Neutral Ground*, between the Portuguese and Spanish dominions.

Eighteen leagues S.S.W. $\frac{1}{4}$ W. from the bar of Rio Grande is the redoubt of Mangavena, which is the limit of the Portuguese dominions, and 21 leagues farther S.W. by S. and S.W. $\frac{1}{2}$ W. is the mark of the north limit of the Spanish dominions. Hence to Cape St. Mary it is S.S.W. $\frac{1}{2}$ W. 21 leagues.

*REMARKS on the WINDS, WEATHER, CURRENTS, &c.
in the RIO DE LA PLATA, or RIVER PLATE, with IN-
STRUCTIONS for NAVIGATING therein.*

By Captain Peter Heywood, of the Royal Navy.

At the entrance of the Rio de la Plata, the prevailing winds during the summer months, from September to March, are north-easterly, with tolerably clear weather over head, but a dense atmosphere near the horizon. These winds haul gradually 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 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, speaking generally, when the weather is fine and settled, and the winds moderate, do not, in any part of this river, rise or fall more than five or six feet; though, at Buenos Ayres, at the distance of eight miles from the city, we found, in His Majesty's ship *Nereus*, when the winds were strong at N.W., so little, sometimes, as fifteen feet water: while, with strong breezes from E.S.E. to S.S.W., the depth was upwards of five fathoms: but, except on such extraordinary occasions, we had between seventeen and twenty-two feet water. I have heard, however, some marvellous stories of the river having been almost dried up, across from Buenos Ayres to Colonia, during heavy westerly gales.

The river Plata has many singularities; which I think may, in a great measure, be accounted for, from its formation being so different from any other known river. Its entrance being very wide and very shallow, it is affected by every change in the wind in a most extraordinary manner; so much so, that a shift of wind may be predicted almost to a certainty, by observing carefully the state of the mercury in a barometer and the set of the currents, which usually shift before the wind. In calm weather the currents are generally very slack; and then as regular, almost, as tides: setting up and down the river alternately. When the winds are variable, the currents are equally so; and I have known the ship to be current rode four different ways in less than six hours. When the current comes in from the eastward, along the north bank of the Plata, a north-easterly wind may, generally, be expected to follow; and at the same time (should the wind have been previously to the S.E.) the mercury in the barometer will fall a little; but much more if the transition be quick from south-west without stopping in the south-eastern quarter.

When the wind continues in the north-east quarter, the mercury is more depressed (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 the water off that place, but filling the river above the banks.

The winds between N.N.E. and W.N.W. make the water lowest: the out-set being then strongest along the south bank of the river, past the Points del Indio and Memoria; but very inconsiderable along the north bank.

Before the setting in of a S.W. gale, or pampero, the weather is

usually very unsettled, and the winds unsteady and variable in the northern and north-western boards; preceded by a considerable fall in the mercury, though it usually rises a little again before the wind shifts to the south-west; and often continues to rise, even though the wind may increase from that quarter.

Before these winds set in at Buenos Ayres, the current runs up and fills the river unusually high; at the same time as strong an out-set is experienced along the north bank, which continues whilst the winds are strongest from W.S.W. to south, 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 harbour of Monte Video. Whilst these S.W. winds blow, the air is cold, and the atmosphere clear and elastic, in a degree rarely to be met with in any other part of the world. They are generally succeeded by some days of fine serene weather; the wind continuing moderate from the southward, or varying to the eastward.

I have never known the velocity of the tide or current, in the river Plata, any where to exceed three miles per hour; but I have heard it said, by some, that they have found it run at the rate of six or seven miles an hour!

As the winds outside the river Plata, and particularly about Cape St. Mary, are most frequently from the north-eastward and northward, except when the S.E. summer and S.W. winter gales blow, about the times of new and full moon, I consider it, on the whole, most adviseable, for ships bound into the river, to get in with the land about the latitude of that cape which is $34^{\circ} 40' S.$, and its longitude $53^{\circ} 54' W.$ of Greenwich; or $2^{\circ} 08' E.$ of Mount Video.

In latitude $33^{\circ} S.$ the bank of soundings extends off the land full thirty-six leagues; where the depth of water, in longitude $50^{\circ} 20' W.$ is ninety-four fathoms; and the quality of the bottom dark olive-coloured mud, or ouze, as it is all along the outermost verge of the bank.

In latitude $34^{\circ} S.$ and thirty leagues from the land, the bank is steep, and the soundings decrease quickly, in standing to the westward, to twenty-five fathoms, twenty leagues from land.

In latitude $34^{\circ} 20' S.$ and longitude $51^{\circ} 50' W.$, or about thirty leagues east of the Great Castellon Rock, the depth is sixty-three or sixty-four fathoms, dark mud. In standing in for the land, between the Great Castellon and Cape St. Mary, the water shoals, in a short distance, from sixty to twenty-five fathoms; and the quality of the bottom changes to sand, which grows coarser as you approach the coast; and, as far as seven leagues off shore, is intermixed with shells. This bottom is found only in, and to the northward of, the latitude of Cape S. Mary, except very close in with it.

To the southward of $34^{\circ} 40' S.$ the bottom is chiefly mud, intermixed with fine sand or gravel; and if a ship happens 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 eight or nine leagues to the eastward of that island; and the depth of water between them is generally twenty-six to twenty fathoms.

In latitude 35° S. and longitude 52° W. or forty-two leagues true east of Lobos, there are about ninety fathoms water, dark, sandy bottom; from whence the bank of soundings takes a S.W. direction. East of Lobos, twenty-seven leagues, the depth is twenty-five fathoms; and in steering in, on its parallel, the same depth nearly continues till very near that island. But, if set a little to the southward of Lobos, the water will shoal even to ten 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 $52^{\circ} 30'$ west; or full eighteen leagues to the eastward of the meridian of Lobos.

Thus the approach to this river cannot be considered dangerous, if proper care be taken in navigating, and due attention paid to the lead, and to the course steered.

I shall here insert the Honourable Captain Bouverie's description of Cape St. Mary, &c. which I believe to be very correct, and his directions judicious.

"Cape St. Mary is a low point, with rocks all about it. The direction of the coast, to the westward of this Cape, becomes more westerly than at any other part northward of it. About six miles north of it is a house, with a row of trees northward of the house, (probably a fence of high, prickly pear-bushes,) which is very remarkable.

"About a mile south of the house is a bluff point, with a few rocks at the foot, which is remarkable, being different from the rest of the coast, the general character of which is a sandy beach. One cannot fail knowing the Cape by these marks, running down the coast near it. If you are at any distance off, you will not perceive them. The water off Cape St. Mary is shoaler than to the northward. Off the Cape, in a S.E. direction, you have eight and a half fathoms at the distance of four or five miles."

I am inclined to think Captain B. may have been somewhat deceived in his estimation here; for, in H.M.S. *Nereus*, I found more water at the distance he mentions. On the 17th November, 1810, at noon, in latitude $34^{\circ} 42'$ S. and longitude about $2^{\circ} 20'$ E. of the Mount Video, had light winds from S. by W. and fine weather. At half-past one p.m. tacked in twenty-three fathoms to stand in shore, and carried from that depth to eighteen fathoms, when sights were taken for the chronometer, which made $2^{\circ} 13' 21''$ east of Mount Video, Cape St. Mary bearing N. 66° W.; and standing on, laying up west and W. by N. tacked in twelve and a half fathoms water, the prickly pear-hedge, (mentioned by Captain Bouverie,) being on with Cape St. Mary, (which is formed by a low rocky islet nearly joining the shore,) bearing north by compass, and the breakers stretching to the S.E. of the Cape, N. 7° E.: about three miles was our distance from the Cape.

Captain Bouverie, in continuation, says,—“To the northward of the Cape, between it and Palma, you have ten or eleven fathoms at a little distance from the shore.

"Ships, in general, make the land with north or N.E. winds; therefore it is best to keep in the latitude of the Cape, or a little to the northward of it, till you get soundings, as the current sets to the S.W. It is better not to make the land north of the Cape; not that I believe there is any absolute danger, but the water in many places is shoal a long way off the land, and would alarm any one not acquainted with that circumstance.

"In latitude $33^{\circ} 27'$ S. and longitude $52^{\circ} 9'$ W. is a shoal, where we found nine fathoms water. I believe it is a ridge running in that parallel of latitude all the way to the shore. In latitude 34° S. is some tolerably high land, on which is a Spanish fortress, called Fort Teresa. It is a square, with bastions at the angles. It has three guns in the face and one in the flank, and stands about a mile from the beach. About six leagues N.N.E. from it is a mark set up, as the termination of the Spanish territories.

"Being in latitude of Cape St. Mary, and having got ground in twenty-eight or thirty fathoms water, fine sand and shells, you may reckon yourself twenty leagues off shore: with from fifteen to twenty fathoms, sand and clay mixed, you are not far off the land. When you have not seen the land before night, be sure to keep the northward of the Cape by your reckoning, to allow for the current which sets to the southward. This is the case with the above-mentioned north and N.E. winds. With south and S.W. winds the current runs strong the other way."

I am inclined to think that the strong north-easterly currents, which are to be met with off the mouth of the Plata, when the wind is about to blow, or blowing, from the south-westward, do not extend much, if at all, beyond the bank of soundings.

Agreeing in opinion with Captain Bouverie, that, generally speaking, it is advisable to make the land about Cape St. Mary, I would also recommend, if the wind should be any where between S.E. and N.N.E. to enter the river on the north side of the English bank, passing Lobos, on either side, according to the wind and state of the weather. There is a good passage between Lobos and the main, having seventeen to fourteen fathoms water.

The island of Lobos is in latitude $35^{\circ} 1'$ S. and longitude $54^{\circ} 38'$ W. or $1^{\circ} 24'$ east of the Mount Video. It bears about S.W. by compass from Cape St. Mary, distance forty-one miles. The variation off it is 13° easterly, (1813.)

When within three or four leagues of Cape St. Mary, in seventeen or eighteen fathoms, S.S.W. by compass is a fair course to steer for passing outside of Lobos in the night-time; for, with the wind from the eastward, or N.E. the set along shore into the river must be guarded against. Steering this S.S.W. course, the depth of water will increase to twenty and twenty-two; and some casts, perhaps, of twenty-five or twenty-seven fathoms, (if you are set neither to the westward nor to the southward of it,) and the bottom will change, first to sandy mud, and then to dark blue mud, as you approach the latitude of Lobos. If you are set to the southward, in steering S. S.W. you will not deepen so much; the bottom will keep sandy;

and when you approach the latitude of Lobos, you will have no more than nineteen, eighteen, and seventeen fathoms; but if you are set to the southward of Lobos a few miles, you will have hard casts of from sixteen to ten fathoms, and may rest assured of being on the parallel of the English bank, and may therefore make a west-northerly course true, till you find the bottom soften; as it is all dark blue, or greenish mud, in the channel, between the foul ridge of the English bank and the north shore, all the way up to Monte Video, in the fair way from Lobos. When off Lobos, if the weather threaten, and it should be likely to blow, a ship will find safe anchorage in the harbour of Maldonado, sheltered from southerly winds by the island of Goritti, which bears N. 42° W. true, about 11 or 12 miles from Lobos. As I have never been in Maldonado myself, I shall insert here what Captain Bouverie says about it.

“The Spanish surveys of this bay lay down a sufficient depth of water for any ship between every part of the island and the main; however, it cannot be safely entered, but by small vessels, except to the westward; and you must not go farther in than to bring the N.W. point of Goritti to bear S.S.W. $\frac{1}{2}$ W. or S.W. by S. by compass, with four and a half or five fathoms good strong clay. With southerly winds there is, in the east passage, a heavy swell; and the water, from the ground being uneven, breaks almost the whole way across in bad weather. The Diomedé (fifty-gun ship) passed through it to the anchorage before its dangers were known, and had not less than eighteen feet: but there are places where there is so little as one and a half fathom; and it is very irregular. There is a bed of rocks to the south of Goritti: the marks for it are,

“The Tower of Maldonado.....North.
And the outer part of Point “del Este” E.N.E. $\frac{1}{2}$ E.

“In the direct line of the entrance of the bay, from the westward, is a bed of rocks, where there are parts having only three and quarter-less three fathoms. The bearings, taken on the rocks, are,

“N.E. point of Goritti.....E. $\frac{1}{2}$ S.
N.W. point of do.....E. by S. $\frac{1}{2}$ S.
S.W. point of do.....S.E. by S.
Point “Ballena”.....W. by N. $\frac{1}{2}$ N.
The hill of “Pan de Azucar,” just within the extreme of Point
“Ballena.”

“In mid-channel, between these rocks and the island, are six and a half and seven fathoms: their distance from the island is about three quarters of a mile. There is seven fathoms close to them, all round the western side. The watering place is on the main, close by a battery: the stream loses itself in the sand, except when swollen by heavy rains, and you have to roll your casks about sixty yards over the sand: the water is very good.”

Having Lobos bearing N. by W. by compass, distance three or four miles, you will have about eighteen fathoms; and in making a compass course, W. $\frac{1}{2}$ S. by ground log, (having due regard to the wind and current at the time,) you will make the island of Flores a-head

of you. In this track your soundings will gradually decrease from eighteen to twelve fathoms, due south of Black Point, and to seven or eight fathoms when you approach within nine or ten miles of Flores.

Though Captain Bouverie says, "you may run quite up to Monte Video, either by night or day, by making a due west course, first trying the current to make allowance for it;" and though I have frequently done it myself, yet I would not recommend it as a general rule to be followed by strangers to the river Plata. Great care and attention to the course made good, and to the soundings, are indispensably requisite in those who attempt to conduct vessels during the night, in any part of this river; and even these have been but too often insufficient to save ships from destruction. But, in merchant vessels, I fear we cannot always expect to find those qualities; and therefore I withhold my opinion of its being advisable for them to run in the night; neither can it be done by men of war without some risk.

Flores bears, by the world, W. $4^{\circ} 30'$ N. from Lobos, distant fifty-two miles. It lays nearly N.E. and S.W.; has a small hummock in the middle, and one at each end: that to the S.W. being thirty-nine feet high. Between these the land is low and marshy; and overflowed sometimes between the central and N.E. hummock. It may be seen at the distance of five or six leagues from a ship's deck in clear weather.

There is good anchorage all round this island; but a reef extends in a N.W. direction from the north point about a mile. Seals and sea-lions, and various aquatic birds, resort to this small island as well as to Lobos; and, in the months of August and September, great quantities of very excellent eggs may be procured. With the wind easterly, boats may land on the western side of Flores, particularly in a small cove, very near the S.W. part of the island. From Flores, W.N.W. the "Caretas" rocks (above water) are distant about five miles; and there are five fathoms between them. True south, at the distance of eleven miles from Flores, is the north part of the English bank; on which, in that latitude, $35^{\circ} 8'$ S. there is about twelve feet water. The depth of water, between Flores and the English bank, is seven fathoms, all the way across, to within a very little distance of both. The English bank, in latitude $35^{\circ} 12'$, generally breaks; and, with a low river, is above water in some places. Its extent, to the southward, has not yet been accurately defined; and, for seventy or eighty miles to the south-eastward of it, the ground is said to be foul and uneven, and has not been explored.

Between the Archimedes and the English bank there is a swatch of five fathoms water, (according to Captain Beaufort of the Royal Navy, who explored these banks in 1807,) and as many miles wide.

The shoalest part of the Archimedes' bank, about two fathoms and three quarters, is four miles in extent, about north and south by compass; and there are four fathoms all round it. The centre of it is in latitude $35^{\circ} 12'$ S. and the Mount Video bears N. 22° W. by the world from it, distance twenty miles. Besides this bank, there is a

small knoll, in latitude $35^{\circ} 14' S.$, which is true south, from the Mount Video, twenty-one miles; and has not more than three fathoms and a half water on it, and about four fathoms all round it.

Passing to the southward of Flores, at the distance of a couple of miles, you have six and a half or seven fathoms, and may steer W. half S. by compass, to pass point "Braba, or Bold Point," which bears true W. $4^{\circ} N.$, distant four leagues from the S.W. end of Flores. This point is bolder to than the land to the westward, between it and the town of Monte Video, and may be passed close, in four and a half or five fathoms, at a mile or a mile and a half distance. The best anchorage for a frigate, off the town of Monte Video, is with point Braba, bearing by compass, E. by N. $\frac{1}{2} N.$ the cathedral N.E. by N., and the Mount about N.W. by N. in three and a half, or four fathoms, two miles or more from the town, with the harbour quite open. The bottom is all soft mud.

The harbour of Monte Video is very shoal, having only from fourteen to nineteen feet water; but, the bottom is so very soft, that vessels receive no damage by grounding there. Captain Bouverie says, "A S.S.W. wind which blows right into the harbour, and causes a good deal of sea, always occasions the water to rise a fathom or more.

"In a long continuance of fine weather, the tides sometimes assume the appearance of regularity: but this is not often the case. They are governed entirely by the winds. The winds from the southward cause the water to run out on the north shore strongest. Fine weather, and a N.W. wind, make the water lowest. It is usual, in Monte Video harbour, to have an anchor to the S.E. and another to the S.W., and to take one in abaft from the northward; for the water forced in by the southerly wind, sometimes rushes out with astonishing rapidity; when the anchor to the north is of the greatest service."

The Mount Video is in latitude $34^{\circ} 53' S.$, longitude $56^{\circ} 03' W.$ of Greenwich; being $1^{\circ} 24' W.$ of the island of Lobos, and $2^{\circ} 10' E.$ from the cathedral of Buenos Ayres. On the summit of this mount is a fortified building, whose base is forty-two feet six inches by twenty feet, used sometimes for a light-house. The diameter of the lantern is ten feet six inches, and its elevation above the level of the sea four hundred and fifty feet. At the base of the mount are several runs of excellent water, particularly in two small, smooth, sandy bays on the S.W. part of it, where ships in the outer roads may supply themselves with ease; and another on the east side of the mount, just abreast of Rat Island, adapted to ships in the harbour.

Giving the preference to the passage on the north side of the English bank, especially when the wind is any where between S.S.E. and N.N.E. on passing Lobos, because it may be expected most probably to shift, if it does at all, round by the north to the westward; though, perhaps, not before that wind, and the in-set together, might carry a ship up to Monte Video: yet if the wind should be to the north-westward at the time of making the land, it may be pretty confidently expected to shift next to the westward or S.W.;

and therefore a ship should not strive to beat up, round Lobos and the north channel, against an out-set, but stand at once over towards Cape St. Antonio; where, by the time she could stretch across, she would most likely find a S.S.W. wind and N.W. current to run up with, along a weather shore, to Buenos Ayres; or to Monte Video, if bound thither, passing to the westward of the bank of Archimedes, in about five fathoms water; or if the Mount should be seen in good time, never to bring it to bear to the westward of north, by compass, till within five leagues of it.

In standing to the southward, from abreast of Cape St. Mary, with the wind south-westerly, a ship will have from eighteen to twenty-four or twenty-five fathoms when in the latitude of Lobos, and about twelve or thirteen leagues to the eastward of it; and, making a S.S.E. course, the water will then shoal to eighteen, sixteen, twelve, or eleven fathoms, in crossing the ridge, which is generally composed of sand, grey speckled, mixed with stones hereabouts; after which the depth increases gradually to thirty-five or thirty-six fathoms, over a sandy bottom, in latitude $35^{\circ} 40' S.$, and longitude $53^{\circ} 25' W.$ In the latitude of 36° south, and fifteen or twenty miles farther to the eastward, you will deepen off the bank entirely. A ship, having got as far to the southward as $36^{\circ} S.$, may consider herself in the fair way for proceeding up on the south side of the English bank; and, if the wind serve, a true west course may be made good.

In latitude $36^{\circ} S.$ the depth of water on the meridian of Cape St. Mary is thirty-eight fathoms; and the bottom fine grey sand, like ground pepper.

Keeping still to the westward, on that parallel of $36^{\circ} S.$, the depth decreases to nineteen or eighteen fathoms, true south of Lobos; and for ten leagues further you have from that to fifteen fathoms. But if from the latitude of $36^{\circ} S.$ on the meridian of Lobos, you make a W. by N. or W. by N. $\frac{1}{2}$ N. course true, you will shoalen the water to 8 or $7\frac{1}{2}$ fathoms, in latitude $35^{\circ} 45' S.$ on the meridian of the English bank. The quality of the bottom, generally, in this track is sandy, mixed with small stones; and the nearer you approach to the ridge of the English bank it is intermixed with bits of shells, and sometimes with clay or mud.

From latitude $35^{\circ} 45' S.$, due S. of the English bank, a W.N.W. true course to latitude $35^{\circ} 33' S.$ will bring the Mount Video to bear north by the world, in about six fathoms and a half, mud, at the distance of thirteen leagues from Point Piedras: and from this position the same true course may be made to raise the land about Point del Indio, if bound up to Buenos Ayres; or N.W., or more northerly, to get sight of the Mount Video; having due regard to the set of current, up or down the river, that you may neither be horsed on the S.E. tail of the Ortiz Flats, nor on the western part of the Archimedes' bank. The bottom above this is soft mud, or clay, in the channels, fit for safe anchorage. In latitude $35^{\circ} 30' S.$, or thereabouts, and due south of the Archimedes' bank, or some miles further to the eastward, I have been told by some persons they have had as little as four fathoms, hard ground.

Ships leaving Monte Video, to proceed up to Buenos Ayres, must be very attentive to the lead; and the course steered across the river must be very carefully regulated by the set of current at the time. If the weather be sufficiently clear, the Mount is the most sure guide, keeping it by an azimuth compass, on the magnetic bearing N. E. by N.; and when it sinks to an eye in the top, a more westerly course may be steered to raise the land about Point del Indio. This direction is intended to apply particularly to frigates, or any ships drawing more than sixteen feet water; because it is not advisable for them to cross the tail of the Ortiz Flats much further to the westward than a true S.W. course from the Mount will take them; for, with a low river, I have had barely three and a quarter fathoms, in the Nereus, with the Mount bearing N. 35° E. by compass, distant ten leagues. At other times, I have sunk the Mount on a N. 53° E. magnetic bearing, and had as much as three and a half fathoms water; but the river was then well filled.

On the south-eastern part of the Ortiz bank, which is there hard, stony sand, there is still remaining (in 1813) part of a mast, or beacon, about twelve or thirteen feet high. It is in latitude $35^{\circ} 02' 15''$ S. and $0^{\circ} 45'$ W. of Mount Video; from which it bears W. 14° S. by the world, thirty-seven miles. There is about twelve or thirteen feet alongside of it; three fathoms two miles to the eastward of it; but not more than ten or twelve feet, as far as three miles S.W. of it. Point del Indio bears true S. 33° W., sixteen or seventeen miles from it.

For the distance of full seventeen miles to the south-eastward of the Ortiz Beacon, there is generally no more, and often less, than three and a half fathoms; the bottom tough clay, nearest the bank; and in some places farther to the south-eastward, soft mud, not more than three and a quarter fathoms.

After sinking the Mount about N.E. by N., and having three and a half fathoms, a W.S.W. course will raise the land (if the weather is clear) about Point del Indio to the eye at the mast-head; and probably you will not have more than three and a quarter, or, at best, three and a half fathoms. The Mount and land near Point del Indio are sometimes visible at the same time.

Point del Indio is in latitude about $35^{\circ} 16'$ S. and $0^{\circ} 56'$ W. of the Mount Video, from which it bears S. 63° W. by the world, distant fifty miles. There is little more than three fathoms at the distance of ten or eleven miles, when the river is in a mean state; farther to the southward, and off Point Piedras, there is only that depth fourteen or fifteen miles off shore. Very great caution, therefore, is required in approaching it; and a constant look-out should be kept for the land, as it is very low, and cannot be seen farther than twelve or thirteen miles, in any weather, from the deck of a frigate.

When the land is barely raised to an eye nineteen or twenty feet above the surface of the water, a W.N.W. magnetic course will lead along shore, between it and the south part of the Ortiz, which is distant about fourteen miles from it; and between them there is no where more water than three and a half, but mostly three and a

quarter fathoms. With a high river, I have had a quarter-less four fathoms. The nearer the Ortiz the deeper the water.

In steering up W.N.W. with the land seen from the deck, (if clear weather,) you will have three and a half, or three and a quarter fathoms, (yet if the river is low, perhaps some casts of three fathoms,) and raise a remarkable clump of trees, called Embudo; which are much taller than the rest; highest at the west end, and lie in latitude $35^{\circ} 06' S.$; and in longitude $1^{\circ} 16' 30''$ west of the Mount Video, or $0^{\circ} 53' 30''$ east of the cathedral of Buenos Ayres. At some distance to the westward of the Embudo Trees, there is another clump about the same height; but these being highest at the east end, are sufficiently distinguished not to be mistaken for the true Embudo.

When in three and a half, or three and a quarter fathoms, the Embudo Trees bear by compass W.S.W.; the S.E. end of the Chico Bank will bear W.N.W. or thereabouts, ten or eleven miles from you; and you must now determine from the water your ship draws, and the then direction of the wind and state of the weather, whether you will pass between the Chico and the shore, or between the Ortiz and the Chico.—I have passed up and down several times between the Chico and the south shore in the Nereus, lightened in her draft to eighteen feet three inches, but I would never attempt it again from choice, now I am better acquainted with the middle channel between the Chico and the Ortiz, and have every reason to believe that the middle ground, some charts lay down in it, does not exist.

A ship not drawing more than fifteen feet may take either passage; and, of the two, ought perhaps to prefer that to the southward of the Chico bank, particularly if the wind should be well to the southward, as she might take her soundings from the weather shore, and, keeping in somewhat more than her own draft, run up along it; and, by not deepening above three fathoms, would ensure being to the southward of the Chico.

The S.E. end of the Chico Bank bears from the Embudo Trees N. $32' E.$ true, distant ten miles, and E. $9^{\circ} N.$ thirteen miles from Atalaya Church. Its latitude there is $34^{\circ} 56' 30'' S.$ and longitude $1^{\circ} 09' W.$ of the Mount Video. This bank runs in the direction of N. $52^{\circ} W.$ true, or N. $65^{\circ} W.$ by compass, about thirteen miles to its N.W. end, which is in latitude $34^{\circ} 48' 50'' S.$ and $0^{\circ} 47'$ east of Buenos Ayres' Cathedral. From this N.W. end, in fourteen feet water, Atalaya Church bears S. $14^{\circ} W.$ distant 11 miles; and Point Santiago, forming the Ensenada de Barragan, bears W. $4^{\circ} N.$ fourteen miles from it. The breadth of the Chico does not exceed two miles, or perhaps a mile and a half, and its inner edge is about nine miles from the shore. The water between it and the shore is no where more than three and a half fathoms, and the deepest water is along the inner edge of the shoal, at the distance of half a mile from it, or less in some places. About midway between it and the shore there is a quarter-less three fathoms. On some parts of the Chico there is very little water, and within the limits I have assigned to it, no where more than fourteen feet. There was, for some years, the mast of a vessel, called the Pandora, which was wrecked on this shoal, in latitude $34^{\circ} 54' S.$ about

five miles from its S.E. end, which proved an excellent beacon to guide ships passing it on either side; but it has disappeared. It is very necessary that three buoys should be placed on this dangerous shoal to mark its centre and each end.

To ships drawing less than fifteen feet, it is only further necessary to recommend care and attention on approaching Point "St. Jago," which forms bushy and distinct; and when it is brought to bear to the south-westward, haul out into the stream of three and a half fathoms, to round outside the Spit, which runs about N.W. by compass from Point St. Jago at least ten or eleven miles; its extreme point in two fathoms being about five miles from the shore. When two remarkable trees on Point Lara are brought to bear S. by E. $\frac{1}{2}$ E. or S.S.E. by compass, you are past the Spit. This mark will also lead a ship of that draught of water clear to the westward of the Spit, in running in towards Ensenada.

After passing the Spit off Point St. Jago, in three and a half fathoms, a W. by N. northerly course by compass will lead up to the outer Road of Buenos Ayres, where any ship may safely anchor in the water she draws, if the river is low.

Frigates, or any vessels drawing more than sixteen feet water, should barely raise the land about Point del Indio to the eye on deck, and borrow nearest the Ortiz: more particularly when the Embudo Trees are brought to bear as far as S.W. by W. (magnetic;) for, with the Embudo bearing from S.W. to S.S.W. the bottom is flat, off to three fathoms, full seven miles from the shore, and chiefly hard clay. Therefore, when the Embudo Trees bear W.S.W. by compass, and you are about nine or ten miles off shore in three and a half fathoms, if you have a leading wind, haul to the N.W. by W. or more northerly as may be required to clear the S.E. tail of the Chico, and you will soon deepen your water to four fathoms, and more, in the middle channel, between the Chico and the Ortiz Shoal. The fair course through between them is about N.W. by W. $\frac{1}{2}$ W. (magnetic,) and in mid-channel the land can but just be distinguished from the quarter-deck of a frigate. When the Embudo Trees bear S. 20° W. by compass, you will be abreast of the S.E. end of the Chico, and may either take your shoal soundings along its northern or outer edge, to about a quarter less four, if the wind is southerly, or if the wind be northerly, or easterly, borrow into a convenient depth along the southern edge of the Ortiz.—I believe the breadth of this middle channel may be five or six miles, and the depth of water from four to five and a half, and even six fathoms, in the fair-way, about the N.W. part of it, and abreast that end of the Chico. The quality of the ground all the way through this channel is generally soft mud, and fit for safe anchorage.

The N.W. pitch of the Chico Bank being passed, and the depth of water five or five and a half fathoms, you may steer by compass W. by N. $\frac{1}{2}$ N. or W. by N. for Buenos Ayres, taking care not to shoal under quarter less four, off Ensenada, till Point Lara Trees bear S.S.E.

A little more than half way from Point Lara to Buenos Ayres there

are two other remarkable trees. When moored off Buenos Ayres, in the Nereus, in nineteen feet water, and the bottom soft mud, these trees bore, by compass, S. 17° E. the Cathedral S. 67° W. and the Spire of the Recoleta Convent S. 76° W.: the latitude observed was 34° 34' 30" S. and the longitude by the moon 58° 02' west of Greenwich; at the distance of eight miles from the Cathedral. Variation of the compass 12½° easterly.

DIRECTIONS for sailing from the COAST OF BRAZIL toward the CAPE OF GOOD HOPE.

During the greatest part of the year the S.E. trade-wind fails about the tropic of Capricorn, or from 1 to 3 degrees to the southward of it, where the wind generally veers from eastward to north-east and northward. The northerly winds generally prevail most in the vicinity of the S.E. trade, and thence to the parallels of 34° or 35° S. in all the space from the Coast of Brazil to the meridian of London, or a little farther eastward. Therefore a ship departing from the Coast of Brazil, having arrived to the southward of the S.E. trade, and in the variable winds blowing from N.E. to N.W. and sometimes to W. and W.S.W. should immediately shape her course eastward, and increase her latitude gradually as she proceeds, so as to get in the parallel of 35° S. at the time she has reached the meridian of London; then, as she approaches the Cape, to keep in 35° or 35° 30' S. to prevent being driven to the northward of Table Bay by the southerly and south-easterly winds, which blow frequently in the vicinity of the Cape and sometimes so far westward as the meridian of London; particularly in the months of January, February, March, and April. A ship, by following this track, will frequently make greater progress than by going to 37° or 38° of south latitude in search of westerly winds.

These N.E. and northerly winds, in the vicinity of the S.E. trade-wind, are generally attended with smooth water and fine weather: when they are accompanied by cloudy weather there is a risk of a sudden shift to S.W. or south. The westerly winds which generally prevail in latitude 36° or 37° to 39° south, are often very unsettled, varying with the sun round the horizon every 2, 3, or 4, days, with intervening calms, particularly when it is in the south-west quarter.

A ship intending to double the Cape should endeavour to cross the meridian of London in latitude 37° or 38° south, and run down her easting between the parallels of 37° and 39°, as the winds are found to be as favourable for this purpose between these parallels, or probably more so, than in a higher latitude. By keeping so far south as the parallel of 37° she will avoid the westerly current on the bank of Cape Aguilhas.

During the southerly winds at and in the vicinity of the Cape of Good Hope, there has been no current observed to set to the northward farther to the westward than 35 or 40 leagues from the land. At about 35 leagues westward of the Cape a current was found to set west-north-westward at the rate of about 1 knot: at about 15 or 20 leagues off, it set about N.N.W.; from 6 to 10 leagues off, it set

along shore to the northward, and in soundings from 50 to 15 fathoms an eddy current was found setting to the southward.

The Cape of Good Hope, whether seen from the eastward or westward, makes like a large island, when you are at such a distance as to sink the land by which its mountains and the other mountains are connected. All the land about the Cape is very lofty, but the highest and most remarkable is the Table land, a mountain about 1184 yards in height, quite level at the top, as its name indicates, and falling down perpendicularly at both ends, till it joins the high lands near it. The east part of the Table land joins to a high peaked mountain, called the Lion's Head, or Charles's Mount, which is 1105 yards in height, and the west part joins to the Sugar-loaf-hill, which is 720 yards in height. On the top of the latter is a look out house, where a flag is hoisted when any ships appear in sight. To the north-westward of the Sugar-loaf is another mountain, 382 yards in height, called the Lion's-rump, on which a look out is also kept, and a flag hoisted on the appearance of a sail.

Directions for sailing into Table Bay, False Bay, &c. will be given hereafter.

ISLANDS in the ETHIOPIC, or SOUTH ATLANTIC OCEAN.

FERNAND DE NORONHA, the ROCCAS, &c. have been before described, pages 30 and 31; we now proceed to a description of

ASCENSION ISLAND. This island is about 3 leagues in length from north to south, and 2 leagues broad; it has several peaked hills on it, of which the highest, called Green Mountain, is situated near the S.E. part of the island, and appears like a double peak on some bearings: it is about 800 yards high, and may be seen from 14 to 16 leagues. Most of the hills are covered with red earth, like brick dust, and it has a most dreary aspect, there being no verdure except purslane, which grows mostly about the green mountain, whence it derives its name. There is no spring of fresh water on the island; rats and mice abound, and there are some wild goats, but they are very lean. The summit of the mountain is frequently enveloped in clouds or vapour, but it seldom rains here.

This island is seldom visited, except by a few homeward-bound East India ships, or whalers, who stop here for a supply of turtle; but they are now scarce, and often cannot be obtained.

A ship intending to stop here should steer round the north point of the island, which is low and rocky, having deep water close to it, and may be passed within 2 cables' lengths with a commanding breeze. When abreast of this point, Sandy bay will soon be seen a little to the S.W. which is a small bay with a white sandy beach, having a regular hill, like a dome, at a little distance inland. This is called Cross hill, from a cross that formerly stood on it; but as the cross was down in 1811, Captain Heywood erected a flag-staff on the summit of the hill, in lieu thereof. From the west point of Sandy bay a reef of rocks projects out about $1\frac{1}{2}$ mile, on which the

sea breaks when there is much swell; at other times it does not. Having passed the north point of the island, haul up into Sandy bay, and anchor in 15 or 16 fathoms water, on sandy bottom, abreast of the beach, at about $\frac{3}{4}$ of a mile from shore, with Cross hill bearing S. by E. $\frac{1}{2}$ E. or S.S.E. Where the depth exceeds 18 or 20 fathoms the bottom is in some places rocky: the bank of soundings extends about 2 miles from shore, all along the north-west side of the island. The best landing place is at the west end of the bay, behind an isolated rock, which makes a sort of division between the Sandy beach bay, and another bay to the westward. This bay has also a sandy beach in some places, and may be considered a continuation of the easternmost bay, but it is not so safe, as there are some detached rocks in it, lying at 2 cables' lengths, or more, from shore. Although the proper anchorage is to leeward, at the N.W. part of the island, there is often a high surf on the shore, and many boats have been stove in landing; great caution is therefore requisite.

The summit of the Green Mountain is in latitude $7^{\circ} 58' 30''$ S. and the anchorage is in $7^{\circ} 55'$ S. and longitude $14^{\circ} 15' 30''$ W. Variation of the compass $12^{\circ} 30'$ W. in 1806.

ST. HELENA. This island is situated in the strength of the S.E. trade-wind; it is about 9 miles in length north-east and south-west, nearly of a circular form, and about 26 or 27 miles round. It affords a dreary prospect from the sea, of high craggy rocks, many of which project over their bases; but the valleys in the interior and likewise the hills are fruitful, and clothed with continual verdure, except in very dry seasons. The principal ridge of mountains in the centre of the island is called Diana's Peak, and is about 733 yards high; nearer the S. W. part there is a hill of a conical form, about 717 yards high, called High Peak. On these hills, and on other high grounds, the air is always cool and pleasant. The peaked hills are frequently enveloped in fog clouds, which, driven from the sea by the trade-wind, strike against them and produce gentle showers, which quicken the vegetation and cool the atmosphere there, although in the valleys on the leeward side of the island the sun is often very powerful. Thunder is seldom heard here; lightning has been at times seen in clear weather, accompanied by a sultry atmosphere. Showers of rain are experienced in all seasons, but in some months more than others.

At the north-east extremity of the island there is a hill close to the sea, called from its form Sugar-loaf-hill. It has a signal post on it, and at its base there are three batteries, at a short distance from each other, called Buttermilk, and Banks's upper and lower Batteries: a little to the S.W. of these, in the bottom of Rupert's-valley, there is a strong stone wall and battery, mounted with heavy cannon, called Rupert's-battery. Munden's-point, which divides this valley from James's or Chapel-valley, has also a battery on it, of the same name as the point, and several guns are placed on the heights over it, which command that side of James's-valley: On the west side of James's-valley is a hill, elevated nearly 800 feet perpendicular from the sea, called Ladder-hill, with a battery of heavy guns upon it, that

commands the south-west entrance to the valley and anchorage: this valley is also protected by a wall and strong line of cannon at its entrance close to the sea.

All ships bound to this island must run down along the north side of it, and within a cable's length, or less, of Sugar-loaf-point; but before they pass that point they must heave to, and send a boat with an officer to report them. The boat is generally hailed from the battery at the point, but she must proceed to James's-town to give information to the governor, before the ship is permitted to pass the first battery at the Sugar-loaf. Ships of war, as well as others, must observe this precaution, or the batteries will open upon them, and prevent them from gaining the anchorage, which, as before said, is well defended by the forts and batteries around.

When the boat is perceived returning, the ship may make sail, and after passing Sugar-loaf-point, within a cable's length or less as before directed, she should keep the shore close on board in passing Rupert's-valley, with the head sails braced well forward, to prevent them from being taken aback, by the gusts of wind from the high land which veers several points. Having passed Rupert's-valley, Munden's-point ought also to be kept pretty close to; but taking care to avoid the *sunken rock* that lies off the fort, about 30 or 40 yards from the point, on which some ships have struck and were nearly lost: there has for several years past been a small buoy with a red flag placed on it. On passing Munden's-point, James's-valley and town will appear, off which is the proper anchorage in from 8 to 15 fathoms, with the flag-staff on the fort in James's-town bearing S.S.E. or S.E. by S. and Sugar-loaf-point N.E. by E. at about half a mile from shore. There is anchorage said to be equally good off the east corner of Ladder-hill, or abreast of it, with the flag-staff about E.S.E. in 14 or 15 fathoms. Ships generally moor with a stream or kedge anchor to the offing; this is particularly necessary for those who anchor near Ladder-hill, on account of the eddy winds and calms which prevail there: those in the stream of the valley seldom swing towards the shore, for a continued breeze and frequent gusts of wind blow from it to seaward.

There are no soundings until you come abreast of Rupert's-valley; then you will find 18 or 20 fathoms: the bank runs out to the westward from the fort about $1\frac{1}{4}$ mile, and deepens gradually from 7 near the shore, to 30 or 35 fathoms about 1 mile off, whence it deepens suddenly to 60 fathoms, and then no soundings.

Here is plenty of good water, but wood is a scarce article, furze being the principal fuel of the islanders. The water that supplies the garrison and shipping is conveyed in leaden pipes from a spring in the valley to the jetty, where there are cranes to strike the casks into the boat: another watering place is at Lemon-valley, where you fill your casks in your boat with an hose, only it is a little farther to fetch it. Cabbages, potatoes, carrots, turnips, and other vegetables and fruits, are to be had, but very dear. A few hogs may sometimes be procured at a high price, but poultry is always very dear.

Besides the fortifications already mentioned, there is also a battery at Sandy-bay, on the south side of the island, where boats might land, when the surf is not great; and every other part, where there is a possibility of landing, is well secured by batteries, or guns, placed on the heights over them. There are also on the summits of the hills all over the island signal posts, which communicate by telegraph with each other and with the castle. When a ship is descried, a gun is fired at the signal post where she is first seen, and this is repeated by the other posts to the castle, which is called an alarm; if more ships appear, a gun is fired for each, till five in number, then the signal is made for a fleet; but if more than two sail appear to be steering together for the island, a general alarm is beat, and every person immediately takes the station assigned him, and remains under arms until the governor is informed by the boats what they are. So soon as permission is given to anchor, the drums beat the retreat, and dismiss the people to their respective avocations.

James's-town is in latitude $15^{\circ} 55'$ S. and by mean of several sets of lunar observations, in $5^{\circ} 36' 30''$ west longitude.

MARTIN VAS ROCKS. These are three high and barren islets or rocks, of which the central one is the largest, and may be seen at the distance 8 or 10 leagues from a ship's deck; this is a little more easterly than the other two, although they are nearly on the same meridian, as they are all in one, when bearing north or south. The northernmost and central rocks are near each other, but between the latter and the southernmost there is a channel, through which the Chesterfield passed in March 1800. They are all steep and inaccessible, and the distance between the two extreme ones is about 3 miles: when seen at a distance they appear like five heads of land. The central Martin Vas rock is in latitude $20^{\circ} 28' 30''$ S. and longitude $28^{\circ} 46'$ W. by chronometers from St. Helena.

TRINIDAD ISLAND, called by the sailors Trinidad, is about 6 miles in circumference, the land very high and uneven, is distinctly seen in clear weather from the rocks of Martin Vas, and may be seen from a ship's deck at the distance of 12 or 15 leagues. It extends nearly S.E. and N.W. is rocky and barren in general, but in some parts there are trees of 18 inches diameter on the heights, particularly about the south part of the island. The shore is surrounded with sharp, rugged, coral rocks, and is of difficult access, occasioned by the high surf that continually breaks on it in every part. The fresh water is very good, and is supplied from two small streams, which run down the east and south-west sides of the island; it may also be procured at times from the rock which forms the south-west extreme; neither of them will fill a tube of 6 inches diameter, and it is doubtful whether these streams are temporary or perennial.

Ships should not stop here for water unless they are greatly in want of that article, for the difficulty of getting it from shore is great, and often impracticable; the anchorage is also unsafe, as the winds are often variable, and should a gale happen from west or south-westward, they would be in great danger of driving on shore. The best anchorage for those who are obliged to stop here to procure water

is about a mile off from the west end of the island, that they may be able to clear it on either tack should the wind shift and blow on. Here they will have from 30 to 40 fathoms water, on coarse sandy bottom: within a musquet shot of the shore there are 16 or 18 fathoms, but it is not safe to lie so near. On this side, nearly detached from the island, there is a rock about 850 feet high, with trees on it, called the Monument; it is of a cylindrical form, and was named the Nine-pin, by Dr. Halley in 1700. There is also a stupendous arch, which perforates a bluff rock, about 800 feet high: the arch is about 40 feet in breadth, 50 feet in height and 420 feet in length. The sea breaks through it with a great noise, and there are more than 3 fathoms water under it. When the sea is moderate, you may see through this arch into the only bay in the island, and have a view of a distant rock, covered with trees, which makes the prospect extremely picturesque. At the south-east end of the island there is also a rock of a conical form, about 1160 feet high, with trees likewise on its summit, called the Sugar-loaf; and whenever it rains hard, a beautiful cascade of above 700 feet is projected from it.

Although Trinidad is within the southern tropic, the south-east trade wind is not regular; north-east and northerly winds often happen, particularly the former. Sometimes light airs and calms succeed the S.E. winds; and sometimes hard squalls or S.W. gales have been experienced, which render the anchorage very hazardous.

Captain Charles Lesley, of the Orford man of war, in his journal of 1773 and 4, speaks of the three bays at the S. and S.W. sides of Trinidad. He says "Coming from the eastward, when the easternmost point of the island bears N.E. by E. the bay begins to open, wherein, at the upper end, you will see a hill like a sugar-loaf, and a mile from the shore you will have ground at 45 fathoms, coarse sand; in the mouth of the bay you have 35 fathoms, and by the time you get this length, or very soon afterward, you will perceive three bays, one right a-head, called the northernmost, or middle bay, and one on either hand called the easternmost and westernmost bays. The east is by far the best, the west being full of rocks, and the northernmost having shoal water, and being quite open to the sea. The east bay is likewise distinguished by a church, with a large cross upon it, which stands at the upper end of it, off which you may anchor in 6 fathoms, bearing W.S.W., and a point like the South Foreland, bearing S.W. by W., and thus situated, you may moor your ship with one cable on shore. The watering place is near the church, and you may lay your long boat under and fill with a spout or hose."

Notwithstanding Captain Lesley's description, it would be very imprudent for any ship to anchor in this bay with a S.E. trade wind, and it probably ought never to be done, unless in very settled weather, and the wind fixed at northward; and even then, no navigator would approach so near as to moor with a cable on shore.

Trinidad is often seen by ships passing to the southward through the S.E. trade wind, but is seldom visited, on account of its unsafe anchorage.

By mean of several observations, the centre of the island Trinidad,

is in latitude $20^{\circ} 31' S.$ Captain Peter Heywood, by mean of 4 chronometers, makes its longitude $23^{\circ} 38'$ west of St. Helena, or $29^{\circ} 13'$ west from Greenwich.

Ascensao, or false Trinidad, in the same latitude with the island of Trinidad, was discovered by John de Nova in his passage to India, in 1501. It consists of very high land, and on the north side of it, lies a cove, with a river of fresh water; adjoining to this cove, there is a cavern, into which the sea enters: it lies at the foot of a high mountain, shaped like a peak or sugar loaf, which answers nearly to the middle of the island. On the east side you descry another mountain, nearly of the same shape, but not so lofty; and these two mountains are the highest in this island. On the west side lie 5 small islets, or rocks, one of which, that stretches farthest out to sea, is the loftiest and most distinguishable; it resembles a ship under sail. This island is desert and covered with thorney shrubs; fowl and fish are to be met with there in abundance.

Notwithstanding the credit which ought to be given to a description so circumstantial, many navigators have been, and are still of opinion, that this isle is nothing more than Trinidad itself, which by the inequality of its surface, appeared under as many different forms as the ship, from whence it is descried, varied her position. But the existence of Portuguese Ascensao has been confirmed in 1760, by M. Duponsel de la Haye, Captain of the French Frigate *La Renommée*, who, having sailed by the rocks of Martin Vas, on the 4th of June, passed afterwards to the northward of Trinidad, from which he kept a west course, and on the 8th of June made the island of Ascensao; he saw distinctly a mountain, shaped nearly like a chimney. *M. Lepine*, Enseigne de Vaisseau, touched at both these islands; he gives the latitude of Ascensao $20^{\circ} 33' S.$ and he supposes it to lie about 120 leagues from the coast of Brazil.

M. de la Perouse ran down 7 degrees of longitude west from the Meridian of Trinidad, on the parallel of $20^{\circ} 32' S.$ in search of this island, and found it not, which renders its existence in that part extremely doubtful.

Notwithstanding statements so contradictory, we have, on the credit of M. Duponsel de la Haye, and M. Lepine, ventured, doubtingly, to give it a place in our chart, in the latitude assigned to it by the latter, namely $20^{\circ} 33' S.$ and in longitude $34^{\circ} 33' W.$ which is about 90 leagues from the Coast of Brazil; leaving it to future navigators to ascertain if it really exists.

SAXEMBURG, an island of doubtful existence, is said to have been discovered in 1670 by a Dutchman, who has given a view of it, very remarkable, by a narrow peak like a column in the middle of the island: it is generally placed in latitude $30^{\circ} 48' S.$ and about $19'$ west longitude. Several navigators have seen the appearance of land near this situation, whilst others have searched in vain for the island. Captain Galloway, of the American ship *Fanny*, outward bound for China, in 1804, judges that he saw this island at a great distance. It was in sight four hours from the mast head, without altering its appearance, which was a peaked hill in the centre, and bluff at one of

the extremities: if this was land, it is situated in the same parallel assigned to Saxenburg, but two degrees more to the eastward. The American sloop *Columbus*, is said to have passed close to this island in September 1809, and made it lie in $30^{\circ} 18'$ south latitude, and longitude about $28^{\circ} 20'$ W.

A whaler is said to have wooded and watered recently at this island, and made the watering place, situated at the S.E. part of it, in latitude $30^{\circ} 43'$ S. and longitude $20^{\circ} 50'$ W. Captain Long of the Brothers, who saw it on the 8th of September 1808, says it is from 60 to 80 feet high, bluff at the N.W. extremity, sloping low to the S.E. being about 4 leagues in length, with a sandy shore, and trees scattered within a quarter of a mile of the sea: he made it in latitude $20^{\circ} 30'$ S. and longitude $28^{\circ} 20'$ W.

By these descriptions its situation seems to be extremely doubtful, as many navigators have searched for it in vain, on the parallel commonly assigned to it. We have nevertheless, placed it in our chart, doubtful of its situation, and even of its existence.

Nearly on the parallel of $33^{\circ} 48'$ S. and in longitude, about $21^{\circ} 50'$ W. some breakers were seen by Captain Smith, in the Danish East India Company's Service, in the year 1760. He does not seem perfectly convinced that it was a shoal; however, it is proper to keep a good look out when passing near the place. The Portuguese charts which take no notice of these breakers, place a shoal to the north-eastward of the place assigned to Saxenburg, in the parallel of $27^{\circ} 25'$ S. said to have been seen in 1702. Near the parallel of 33° S. and above 200 leagues north-westward from the Cape of Good Hope, the Dutch Charts exhibit a shoal called Kattendyks Droogte. Lieutenant Grant in a voyage to New South Wales in 1800, 1 and 2, saw dangerous breakers in latitude $31^{\circ} 41'$ S. and longitude $11^{\circ} 31'$ W.

TRISTAN D'ACUNHA ISLANDS, discovered by the Portuguese in their early navigations, were explored by the Dutch in 1643, in the ship *Heemstede*. They consist of three Islands, the largest and northernmost being named after the Portuguese discoverer, *Tristan d'Acunha*. This island is about 6 or 7 leagues in circumference, and of square form, being the base of a mountain which terminates in a peak 2775 yards above the sea, and may be seen at 28 or 30 leagues distance. It is sometimes covered with snow when the sun is in the northern hemisphere.

There is shallow water and breakers extending full two cables length from the west point of the island, but at other parts the shore is bold to. At the north side of the island, the land rises perpendicularly upwards of 300 yards, whence it ascends with a gentle acclivity to the base of the peaked mountain, which rises majestically over the Table land. This island like St. Helena, is formed of abrupt hilly ridges, on the sides of which, are small trees, whose branches hang near the ground. Wild celery, wild parsley, and sorrel, grow plentifully; and wild goats and hogs are found in the interior. About the middle of the north side in a little sandy bay is a cascade, whence excellent water may be obtained, and the landing is easy on the east side of it, at about 4 cables length distance, upon a beach of round pebbles.

His Majesty's ship *Lion*, on Staunton's embassy to China, anchored here, on the 31st of December 1792, in 30 fathoms, on black sand and slime, about 1 mile off shore, with a small rock off the west point of the island just open of the western extremity, bearing S.W. by S. and the cascade of water S. by E. By correct observations and chronometers, her anchorage was found to be in latitude $37^{\circ} 6' S.$ and longitude $11^{\circ} 43' W.$ which longitude has been corroborated by mean of the chronometers and observations of 8 East India ships. There are 18 fathoms close to the shore where the fresh water is; and the whole coast of this and the adjacent islands is fronted by a strong sea weed, which is seen floating on the water in their vicinity, and in patches at a considerable distance. The shores abound with seals and sea lions; there is also plenty of fish, particularly cod.

Inaccessible Island is the middle one of the three, and also the westernmost, situated in latitude $37^{\circ} 18' S.$ and 7 miles of longitude more west than *Tristan d'Acunha*, at the distance of 19 or 20 miles from it. It is 8 or 9 miles in circuit, and may be seen at the distance of 14 or 15 leagues. This island is high, level, and barren, having only a few scattered shrubs on it. There is a rock like a boat under sail at its S.E. point, but no other danger. Several streams of water issue from the top of the mountain.

Nightingale Island, is the smallest and southernmost of these Islands, lying at the distance of 17 or 18 miles from *Tristan d'Acunha*, 5 miles of longitude to the westward of its meridian, and in latitude $37^{\circ} 27' S.$ This island is about 6 miles in circuit, and has 2 rocky islets off the N.E. point, and some at the south point: there are soundings off its east side, but the strong sea weed with which it is makes it difficult to reach the shore.

Captain Peter Heywood of his Majesty's Ship *Nereus*, on the 5th and 6th of January 1811, made the Cascade at *Tristan d'Acunha*, in latitude $37^{\circ} 6' 9'' S.$ and longitude $12^{\circ} 3' W.$ by chronometer, measured from *Rio Janeiro*. The variation of the compass was $9^{\circ} 20' W.$

Good water is easily got from a small lake at the east side of the bay, which is supplied by falls from the mountains. A ship desirous of watering here may anchor with a southerly wind, but if should veer to the northward she should put to sea immediately, as it would be dangerous to remain at anchor with a N. W. or northerly wind. The casks cannot be rafted off on account of the sea weed, but must be hauled off by a line to the boats at anchor.

These islands are frequently seen by ships which haul far to the southward on leaving the S.E. trade, with the view of getting strong westerly winds.

GOUGH'S ISLAND, so called from the name of its discoverer, Captain Charles Gough of the *Richmond*, in the year 1732. It was also explored in 1758, by Captain Frederick Vincent of the *Osterly*, since which it has been seen by several.

This island is about 5 or 6 miles in extent, is elevated about 1460 yards above the level of the sea, and has some small bushy trees on it. The cliffs rise almost perpendicularly from the sea, and several beautiful falls of water issue from the fissures between them. Near the

N.W. point is a rock resembling a church with a high spire on its western end, to the southward of which on the east side of the island, an islet lies near the shore. Within this islet the landing is safe and easy, being protected by the N.E. point from the swell and northerly winds.

By mean of several observations and chronometers, its centre is situated in latitude $40^{\circ} 19' 30''$ S. and longitude $9^{\circ} 41'$ W. Captain P. Heywood, on the 8th of January 1811, made its longitude $9^{\circ} 45' 15''$ W. or $2^{\circ} 18'$ E. from Tristan d'Acunha, by chronometer. Variation $10^{\circ} 30'$ west.

DIRECTIONS for sailing from the EQUATOR to the CAPE of GOOD HOPE, and also to St. HELENA.

A ship bound to the Cape of Good Hope, and having crossed the equator, according to the directions before given, page 29, should, in order to get through the S.E. trade as quick as possible, proceed to the southward, with the yards braced in a little, and flowing sheets. When she is arrived beyond the southern limit of the S.E. trade wind, she will most probably in every month in the year meet with fresh breezes from N.E. to N.W. or more westerly. She then may run down her easting, and gradually increase the latitude as she proceeds, so as to be in 35° S. when she is so far east as the meridian of London; by which track she may make a greater progress, than she would by going so far as 37 or 38 S. in search of westerly winds, which sometimes ships are compelled to do. Having arrived in latitude 35° S. and on the meridian of London, she should, as she advances towards the Cape, gradually proceed into $35^{\circ} 30'$, because the southerly winds which prevail around the Cape land, from January to April, particularly in February and March, and at times in other months, extend far to the westward. Therefore she ought to keep in $35^{\circ} 30'$ if possible until the Cape is nearly approached, to prevent being driven to the northward of Table Bay.

Ships bound to St. Helena, and having crossed the Equator as before directed, generally stand to the southward as far as $29^{\circ} 30'$ south latitude, or even 31° if necessary, until they get variable winds, with which they run down their easting, and then stand to the northward into the S.E. trade for the island. Some few ships have found the trade wind vary so much, that they have never gone to the southward of 20° south latitude, but availing themselves of the changes, have tacked as the wind varied, and worked up to the island between it and the parallel of 15° south; but this has seldom happened.

During the months of November, December, January, February, and March, if on crossing the equator, a ship finds the wind incline from south westward, she may, by standing south eastward across the Gulf of Guinea, close on a wind, and afterwards tacking as it veers to the east or west of south, most probably reach St. Helena in less time than if she had proceeded by the former, or western route. But

when the sun has great north declination, this eastern route seems precarious: the other is certain at all times. Although it has been the practice of ships going the western route, to run so far as 32° and 33° south latitude, yet it can seldom be requisite so to do, as it lengthens the passage: these ships which have not proceeded so far south have generally made the best passages to St. Helena. From the time of losing the N.E. trade wind, forty or forty-four days may be considered a fair passage by the eastern route in the above months. From the same limit forty-three days may be considered a medium passage by the western route; and during any months in the year it may be made in this time. From St. Helena to the cape, a month is considered a fair passage.

CAPE of GOOD HOPE and BAYS in its Vicinity, with DIRECTIONS.

THE CAPE of GOOD HOPE always appears like an island when seen at any considerable distance from sea; the high lands, of which it is formed, consist of the Table-Land, and Lion's-head, or Charles' Mount, the Sugar-loaf-hill, and the Lion's-Rump, all heretofore described, page 65. On the east side of these mountains, is the low sandy isthmus between Cape town and False bay.

TABLE BAY is readily known, by its lying to the northward of these high mountains, which are so remarkable that they cannot be mistaken for any other land: the north extremity is called Green Point.

Penguin Island is low and flat, and lies about 5 miles to the northward of Green Point: this island must not be approached nearer than 2 miles, on account of a sunken rock called the Whale, lying about $1\frac{1}{2}$ mile from its south extremity, on which the sea breaks when there is much swell; at other times it is not perceptible.

The entrance to Table Bay is between Penguin island and Green point; the latter may be approached to the depth of 10, 9, or 8 fathoms without danger; then steer towards the shipping in the road, in 8, 7, or 6, fathoms regular soundings. The proper anchorage in the bay abreast of the town, is sandy bottom; in the summer months a ship may moor in 7, 6, or 5 fathoms, with Green point bearing N.W. $\frac{1}{2}$ N., the body of Table Mountain S.W. $\frac{1}{4}$ S., the flagstaff on Lion's-rump W. $\frac{1}{2}$ S., and the house on Penguin island N. $\frac{1}{2}$ W., at the distance of $\frac{1}{2}$ to 1 mile from shore, and from 1 to $1\frac{1}{2}$ mile from the town. When N.W. winds are expected, ships should not anchor in less than $6\frac{1}{2}$ or 6 fathoms, because the swell runs more regular than in shoal water, and at these times they should ride with a whole cable or more, lest they should drive, in which case it would be difficult to bring them up again. The best ground is in from 5 to $7\frac{1}{2}$ fathoms: farther out, with the Lion's-head in one with or open to the northward of the Lion's-rump, the ground is rocky all across the bay.

The prevailing winds near the Cape and in Table-bay, are from the S.E. and southward during the summer, that is from October to

April; the S.E. winds blowing more or less in every month of the year, and generally bring settled weather. N.E. winds are less frequent than any, and never continue long. The S.E. winds extend more than 200 leagues to the eastward of the cape. In May, June, July, and August, the S.W. and west winds blow strong, and are often attended with fogs and cloudy weather; but the N.W. winds are most violent in these months, and frequently continue blowing for several days together, with a clouded sky, accompanied at times with lightning, and showers of hail or rain. These winds extend to 27° S. and to a considerable distance westward. The summer continues from October to April, during which season it has been thought safe for ships to lie in Table-bay, notwithstanding H.M.S. Sceptre and several other ships were wrecked by a severe gale at N.W. in November 1799. These N.W. gales are occasionally experienced about the Cape in every month in the year, but they seldom blow home in Table-bay during the summer months; although there are instances of ships having been driven on shore by them in April. The Dutch fixed on the 10th of May as the period for ships to leave this place, and they never suffered their ships to remain there after that time, on account of the approaching season when N.W. gales are expected to set in, which blow so violently, and raise such a mountainous sea, that it is almost impossible for any ship to ride at her anchors.

In the fair weather season regular sea breezes from S.W. and west prevail in the mornings, and continue until noon, sometimes longer; they are then succeeded by S.E. or E.S.E. winds from the land, which generally blow fresh during the remaining part of the day, and frequently until the following morning, when the sea breeze returns again. Whenever the Table-land, in the summer months, begins to be clouded, it indicates a strong E.S.E. or S.E. wind, which, soon after it is clouded over, comes on and blows excessive hard, sometimes for 2 or 3 days, particularly in January, February, and March. With these winds ships frequently part their cables, or bring both anchors a head; therefore ships ought to moor with good cables; and it is usual, so soon as moored in this bay, to strike yards and topmasts, and make all as snug as possible. When the Table-land is free from clouds the south-easter will be moderate.

Ships bound to Table-bay should always endeavour to make the land to the southward of it, on account of the southerly winds and northerly currents which frequently prevail there; many, for want of this precaution, have fallen in with Dassen, or Coney island, or farther to the northward.

Being off the Cape of Good Hope, you may run close along shore without danger, until you are off Freeman's-point to the northward of Chapman's-bay, where there are some rocks stretching a short distance from shore. Freeman's-bay is between this point and Sugar-loaf-hill. You may pass within $1\frac{1}{2}$ mile of the point, in about 50 fathoms water, sandy bottom. Then in steering for Green-point, at the same distance from shore, you will have 49, 45, 40, 36, and 34 fathoms, fine sand and broken shells. From the fort of Sugar-loaf-

hill to Green-point are several rocks above water, at some distance from shore, but there is no hidden danger. Give these rocks a reasonable berth as you proceed, and you will gradually decrease the depth from 34 to 30, 25, 18, 16, and 12 fathoms, on rocky ground. Green-point, as before said, may be approached to 10, 9, or 8 fathoms, without danger; thence as you proceed towards the road, you will find 7 or 6 fathoms, on rocky bottom, until you get about a mile to the eastward of Green-point, where the bottom is sandy, and fit for anchorage:

It is prudent to take a reef or two in the topsails before you reach Green-point, if near or a little past noon, because sometimes the S.E. or E.S.E. winds blow with great fury out of the bay, when it is quite moderate out of the stream of it. Should a ship, on rounding Green-point, meet with a fiery south-easter, and be unable to work to windward, she may bear away and anchor under Penguin-island, taking care to keep at 2 miles distance from the south and S.W. sides of it, to give a berth to the *Whale*, and a reef projecting from the S.W. end of the island. She may anchor about half a mile off the north end in 9 or 10 fathoms, taking care to avoid a reef that stretches nearly half a mile from the N.W. end. Reefs are said to project about a mile from the S.W. and S.E. ends of the island also. There are some who prefer making short tacks to the southward of Green-point, under lee of the high land, until the violence of the south-easter is abated, to the risk of losing an anchor, by endeavouring to bring up near Penguin-island in a strong gale.

Although all ships going into Table-bay should use the channel between Green-point and Penguin-island, the channel to the northward of the island is most proper for sailing out; because the south-easterly winds, with which ships generally sail, blow steady all the way out: whereas those who sail out to the southward of the island run out of the true wind, and frequently lie becalmed several hours under the high land. Besides, the S.E. winds produce an outset between the island and the northern shore, at the same time that the current sets past Green-point into the bay.

The *Cape Town* is situated at the foot of the Table-land, in a fine pleasant valley near the sea; it is an excellent place for all kinds of refreshments, and the climate being very wholesome, the sick recover there very soon, especially from the scurvy. Wood is scarce and dear, but the water is good and plentiful.

The latitude of the town is $33^{\circ} 58' S.$ longitude $18^{\circ} 28' 30'' E.$ The tide flows here on full and change days until half-past 2 o'clock: spring tides seldom rise more than 5 feet.

DASSEN, or CONEY ISLAND, in latitude $33^{\circ} 24' S.$ lies about 9 leagues north north-westward from Penguin or Robben-island, about 6 leagues to the southward of the entrance of Saldanha-bay, and about 4 or 5 miles from the coast. It is much lower than Penguin-island, and a reef extends from its west side nearly half a league; at the distance of 4 miles to westward of it there are 17 fathoms. The sea breaks on the reef in blowing weather, and also over a sunken rock that lies about $1\frac{1}{2}$ mile from the S. W. end of the island: its

south side is said to be rocky also, but there is anchorage within it. Between Dassen-island and Table-bay the coast is of moderate height, barren and sandy, near the sea. The sea has a blackish stagnated appearance, and there are soundings several leagues off. If a ship running for Table-bay should be driven to the northward of it, by strong southerly winds in the summer season, she may by paying due attention to the lead approach the shore without danger, as the soundings are regular; and at the distance of 2 or 3 leagues off there is generally a current setting to the southward, although without the bank of soundings it sets north-westerly.

This southern current will facilitate the progress of the ship in working up to Table-bay. Between Dassen-island and Penguin-island the depths are from 50 to 60 fathoms about 5 leagues off; from 18 to 22 fathoms 3 or 4 miles from shore, and about 30 fathoms 3 or 4 leagues to the north-westward of Penguin-island. At about 13 or 14 leagues off there are from 105 to 110 fathoms.

FALSE BAY is separated from Table-bay by a peninsula, the southern extremity of which is called the *Cape of Good Hope*. From Table-bay to this cape the land is of considerable height, rugged and uneven, terminating in hummocks at the Cape-point. This cape is the S.W. extremity of Africa: its latitude is $34^{\circ} 24'$ S. and its longitude about $18^{\circ} 31' 30''$ E. or about 3 miles to the eastward of the meridian of Cape-town. The entrance of False-bay lies between the Cape of Good Hope on the west, and False-cape on the east, which is a steep bluff, somewhat resembling a gunner's quoin, and from the southward appears to lean over to the west. It is called Hanglip by the Dutch, and may be seen 7 or 8 leagues off.

The entrance of the bay from cape to cape is about 5 leagues wide, and these are nearly on the same parallel, False-cape being a little to the southward of the other. It extends northward about $5\frac{1}{2}$ leagues, being a large open bay of square form, having several dangers in it, but none of them are situated near False-cape, or in the eastern side of the bay.

On the west side of False-bay a ridge of rugged mountains extend to the northward, and end at the entrance of Table-bay, and from False Cape another ridge of mountains extend to the northward to the bottom of the False-bay. The north part of the bay, between these ridges is low land, the mountains seen over it, being at a great distance in the country. Across the entrance of False-bay the depths are from 40 to 50 fathoms, but a little to the westward of the middle of the entrance is a large rocky patch, having from 16 to 28 fathoms on it, 40 to 46 fathoms within it, and 50 to 60 fathoms without on its south side.

The Bellows. In sailing into False-bay from the westward, be careful of the bellows, a large rock even with the water's edge, about $2\frac{1}{2}$ or 3 miles distant from the Cape-point, in a S. by W. direction from it: the sea generally breaks on it. About 2 miles N.E. from this is another sunken rock called the *Anvil*, distant about 2 miles from the Cape-point: there is a passage between these rocks, and another betwixt them and the land, with a depth of 20 to 7 fathoms, but they

are not frequented, because the bottom is rocky, and the current is rapid. There is also another rock said to lie about $1\frac{1}{2}$ league N.E. easterly from the Bellows, and E. by N. 1 league from the Cape-point, on which the Colebrook was lost in 1778: it was not known before the ship struck on it. When the Colebrook struck, the Royal Admiral passed about a mile within the rock, between it and the land: there are 30 fathoms close to it on either side, yet it is not advisable to pass to the westward of it, except in a case of necessity, or when the sea breaks on it.

The Whittle Rocks is the danger most in the way of ships working into, or out of, False-bay: they are an extensive ledge of rocks nearly a mile in circumference, with from 18 to $4\frac{1}{2}$ fathoms water on them, excepting the shoalest spot, which has only 10 or 12 feet on it, at low spring ebbs, and appears to be 8 or 10 feet in diameter. About a cable's length around this shoal spot, the bottom is rugged and uneven, having some shoal heads of rock with $4\frac{1}{2}$ and 5 fathoms on them. The Trident, Asia, and several ships have struck on these dangers.

In 1811 a beacon was placed about 50 fathoms N.N.E. from the shoalest spot; but it has since been broken away by the sea. From this beacon the following compass bearings were taken: Cape of Good Hope point S. $51^{\circ} 30'$ W.; Commandant's house N. 40° W.; Noah's Ark N. 25° W.; West point of Fish-hook bay N. 20° W.; Muyzenberg point N. 3° W.; Peak of the Devil's Mount N. $5^{\circ} 30'$ E.; Seal Island N. 34° E. and the extremity of False Cape S. $33^{\circ} 30'$ E. Variation 28° W. It lies east $4\frac{1}{2}$ miles from the north point of Little Smith's Winkle-bay, and about 8 miles from Cape Point. Close to this patch of rocks, there are 20 and 23 fathoms.

SIMON'S or SEAMON'S BAY is situated 4 leagues to the northward of the Cape point, near the N.W. corner of False-bay, at the foot of the highest mountain on the coast. It is considered a place of safety at all times of the year, but more especially from the beginning of May to the end of September, when Table-bay is unsafe to lie in. There is room for 10 or 12 sail of ships to lie moored in safety, sheltered from the winds from north to S.E. by the west; and those of the other quarters, which come from the bottom of False-bay, or from the mountains bordering the coast, never blow strong. Ships in this bay receive refreshments and supplies of provision from the interior, and from Cape-town, which is about 6 leagues off. Water is conveniently obtained, and is excellent; and, in case of necessity, you may heave down.

At a short distance from the south point of the bay is a smooth level islet or rock, in form of a barn, called Noah's Ark; and about a mile N.N. eastward from it, lies a small reef near the waters edge, called Roman rocks: between these is the channel for ships. About 2 leagues E.N.E. from the Roman rocks lies Seal island, having a multitude of rocks above and under water near it, some of which extend 2 or 3 miles to the southward, and nearly 4 miles to the eastward: when the sea runs high, breakers are always seen on them. Ships turning to windward in False-bay, should not approach Seal island near than 4 miles on the south side, or 3 on the S.W. side.

The middle and eastern parts of the bay are considered free from dangers, but the ground is rocky and unfit for anchorage.

A ship from the westward, bound to Simon's-bay, with a N.W. wind, should pass to the southward of the Bellows rock, at any discretionary distance: when abreast of it, at 2 or 3 miles distance, the course ought to be E. by S. or E. $\frac{1}{2}$ S. by compass, until she has run 5 or 6 miles. Then she may haul up E.N.E. and N.E. until the Cape bears W.N.W. by compass. She will then be to the northward of the Anvil and Colebrook rocks, and may haul in within 2 or 3 miles of the western shore, by which she will avoid the Whittle rocks, and be in moderate depth for anchoring if necessary.

After passing the Whittle rocks she may continue to steer or work along the western shore, at the distance of from 1 to 3 miles from it, and when she approaches Simon's-bay, Noah's Ark will be seen near the south point of the bay; but the most conspicuous marks are some white sand downs, appearing like snow, in the hollows between the mountains to the N.W. of Noah's Ark.

There are 9 fathoms close to Noah's Ark; and from 10 to 15 fathoms in the channel between it and the Roman rocks. From hence she should steer direct for the white sand downs, until she reach the anchorage in Simon's-bay. In working with a N.W. wind, you may pass on either side of the Roman rocks, as the channel is clear to the northward, and much wider than the common channel; consequently much more convenient.

The best berth in the bay is to have Noah's Ark on with Cape Hanglip bearing S. 38° E. and the north battery N. by W. a little westerly by compass, at about a mile off shore, in 8 or 9 fathoms sand. Moor S.E. and N.W. and from May to September, with your stoutest ground tackle to the N. W., as the winds from that quarter blow strongest; from September to May the contrary, as the south-easterly winds then prevail; but in the latter season ships generally prefer Table-bay.

The latitude of Simon's bay is 34° 15'. It is high water on full and change days at half past 3 o'clock; spring tides seldom exceed 3 feet, and there is very little current at any time.

A ship coming into False-bay from the eastward, if the wind be at S.W. should steer for the west side of the bay, and when the Cape point bears W.N.W. by compass, she will be clear to the northward of the Anvil and other rocks in its vicinity, and may borrow within 2 miles of the shore on the west side of the bay. When abreast of the rocky hill over Little Smith's Winkle Bay, she should not stand farther from shore than 3 miles until she is within the Whittle rocks: she may then proceed as before directed. The channel between the Whittle rocks and Seal Island is not considered so safe, on account of the sunken rocks that lie off to the southward and S.W. ward of the latter. Ships going out of Simon's-bay, and bound to the eastward, should leave the bay so soon as the N.W. winds begin to blow; but if bound to the westward, in the winter season they ought to remain until these winds are on the decline, and get under sail when they shift to W.N.W. and west, because they most commonly veer

from west to S.W., south, and S.E. which will be favourable for doubling the Cape, and proceeding north-westward.

During the summer season the south-easterly winds generally prevail, but do not continue longer than 5 or 6 days at a time, and are always succeeded by variable winds. It frequently happens in Simon's-bay, that these winds, after blowing strong for a day and part of the night, abate before morning, and are succeeded by a land breeze from W.N.W. By taking the advantage of the first of this breeze a ship may sometimes get from Simon's-bay to sea, before the return of the south-easterly wind. Should she fail in the attempt, the most prudent plan will be to return to the anchorage in Simon's-bay.

In the N.E. corner of False-bay is an excellent anchorage, called Gordon's-bay, where a ship may lie perfectly secure in all winds. A ship in Simon's-bay ready for sea, and waiting for a fair wind to proceed to the westward, may weigh with the north-westerly winds and run across to Gordon's-bay, where she may anchor within half a mile of the south shore in 8, 7, or 6 fathoms. Here she may take the advantage of the first S.E. wind, and proceed round the Cape of Good Hope north-westward.

DIRECTIONS for SAILING from the CAPE OF GOOD HOPE towards the ENGLISH CHANNEL.

From the Cape of Good Hope ships generally steer a direct course for St. Helena, but it seems most advisable to steer more westerly, until a considerable distance is gained from the west coast of Africa, because near that coast you are liable to N.W. and N.N.W. squalls at times. These squalls do not often happen, but they have at times been experienced in both seasons.

Having got at a moderate distance from the coast, by steering a course N.W. by N. by compass, a direct course about N.N.W. will be fair for St. Helena. If the wind blows strong from the eastward, it will be necessary to make an allowance for a leeward current, particularly if the weather be cloudy; and in such case it will be prudent to get in the parallel of the island several leagues to the eastward of its meridian, and then run to the westward by day, until the island is seen. This was the method used by all ships, some years back; but now the use of chronometers and lunar observations has rendered this practise unnecessary; for if the weather admit observations to be taken, a ship may, as before said, steer direct for the island. The passage from the Cape to St. Helena may be estimated at 13 or 14 days. The direction for St. Helena will be found page 66—67.

From St. Helena homeward bound, some navigators prefer crossing the equator far westward, with a view of having steady winds, and avoiding a space of variable airs and calms, which they imagine to prevail between the limits of the S.E. and N.E. trade winds farther to the eastward. This opinion seems not supported by experience; for some ships when far to the westward, have been detained several

days by calms, and thick foggy wet weather, with a turbulent swell; when others that crossed the equator in longitude 19° or 20° W., had dry weather and brisker winds, and this has even happened to several ships which passed in sight of the Cape Verde islands. It is however, prudent, in order to avoid the light winds and calms which frequently prevail in the vicinity of the coast of Guinea, not to cross the equator far eastward.

On leaving St. Helena for Europe, a direct course may be steered for the island Ascension, which is about N.W. by N. by compass; and in this part of the passage a steady S.E. trade-wind generally prevails all the year, with a westerly current at times. Ascension may be passed on either side at any convenient distance, but ships generally pass to the westward of it, at from 3 to 12 or 13 leagues distance, and then steer N. by W. $\frac{1}{2}$ W. or N.N.W. by compass toward the equator, which should not be crossed to the eastward of 18 or 19 degrees of west longitude, nor to the westward of 24° or 25° W. When the sun is in the northern hemisphere, it may be proper to cross it in longitude 21° to 23° west, because variable light winds extend a great way out from the coast of Africa, in July, August, and September, while the sun is returning from the tropic of Cancer to the equator.

From the equator a north or N. by W. course may be steered, if the southerly winds become light, in order to reach the N.E. trade-wind as soon as possible; but if variable light breezes are found far to the northward of the equator, a berth of 40 or 50 leagues at least ought to be given to the Cape Verde islands. When in the N.E. trade-wind, in order to get speedily to the northward, the sails should be kept well full, and in this route the gulf-weed will generally be first seen in latitude 24° or 25° north, whence it extends so far northward as 40 or 41 degrees. When ships get to the northward of the northern limit of the trade-wind in latitude 30° or 32° north, they are generally between the longitude of 39° and 42° west.

It is seldom advisable to pass to the eastward of the Azores, because northerly winds, often prevailing between these islands and the coast of Portugal, are unfavourable for pursuing a direct course towards the English Channel. Therefore it is most advisable to pass to the westward of the Azores; or, should the wind veer to the north-westward when near them, it may be most convenient to pass through them, and in this case any channel may be adopted as circumstances require.

It has nevertheless, sometimes happened, that ships which passed to the eastward of the Azores have had S.W. and westerly winds, and reached the English Channel sooner than others which went round to the westward of them.

THE AZORES, OR WESTERN ISLANDS.

These islands are mostly formed of high mountainous land, with steep rocky coasts; they are nine in number, exclusive of a few small islets and dangers, but they afford no safe harbour for large ships, although there are several places where small vessels anchor, all more or less exposed to stormy weather.

The following description of and direction for the Azores, or western islands, are by Don Vicente Tofino; published in 1789.

ISLAND OF ST. MICHAEL. Point Ferreria (which is the most western one of this island) is in latitude $37^{\circ} 54' 15''$ N. and in longitude $19^{\circ} 38' 30''$ west of Cadiz, or $25^{\circ} 55' 30''$ west of Greenwich. It is high and sloped, and a low point projects from the foot of it, which advances into the sea, and gives birth to a ridge that continues to the S.W. on which (according to the pilots of the said island) there is from 7 to 10 fathoms water, with a rocky bottom, at the distance of a league: when there is a heavy sea it rises very high on this ridge, wherefore in such a case it ought to be avoided.

To the S. 23° E. $2\frac{1}{4}$ miles from Point la Ferreria* is to be found the Point of la Candelaria. In the intervening space the coast is almost regular, moderately high, and very clear.

About S.E. 12 miles from Point de la Candelaria, there is Point del Gada, in latitude $37^{\circ} 43' 55''$ N. and longitude $25^{\circ} 42' 42''$ W. of Greenwich, and in the intermediate space the following:—that of Lomba de Cruz, which is high and sloping; Point Feiteira, low and rocky, with small islands; Point Monte Gordo, high and sloped, with a small bay between, which is called "La Caleta," and in which there is a town; and from the last named point the coast goes descending, with a few small points less remarkable, unto that of Del Gada, which is low and rocky, with a castle that defends the anchorage.

To the S. 75° E. distant $7\frac{1}{2}$ miles from Point del Gada, is that of La Galera, low and rocky, with small islands at the foot of it, and a battery. Between these two points the coast forms a large bay or road, to the N.W. part of which, and about N.E. of Point del Gada, distant $1\frac{1}{2}$ mile from the latter, is to be found the Mole of the Town, bearing the same name, which is the principal one of the whole island, and carries on a deal of traffic with its produce between the other western islands and Lisbon. This roadstead, sheltered from the winds and seas from the W.N.W. round by the north as far as east,

*South-west from Point Ferreria and due west from the Pico de Ginetes, at about $1\frac{1}{4}$ mile from the nearest shore, where there was previously a depth of 40 fathoms, a volcanic island emerged from the sea on the 18th day of June 1811, and continued increasing in height and size until the beginning of July, when it had attained the height of from 200 to 300 feet, and the length of two-thirds of a mile. On the 4th of July, the captain and some of the officers of H. M. S. Sabrina landed, and hoisted a union jack upon the top of it; after which it fell by degrees into the sea; and in the middle of October, entirely disappeared, leaving a dangerous shoal on the spot which it had occupied.

offers two anchorages; the principal one to the southward of the town of Point del Gada, in 30 or 40 fathoms, with a sandy bottom, taking care to keep the small island of Cans in a direct line with the church of St. Roque, and the steeple of the cathedral church with a large country house that is to the northward of it.

The small island of Rastro de Cans lies N. 70° E. three miles from Point del Gada: it is easy to be known, for it is the only high and sloping land to be seen at the bottom of the roadstead, at the western extremity of a beach.

The church of St. Roque is at the east end of the town, and is outside of it: its magnitude and fine appearance render it remarkable.

The steeple of the cathedral church of the city, when viewed from south to north, is almost in the middle of it, and is the highest.

The country house that is to the northward of it, and to be brought in a line, is also known, because it is close to a cluster of trees, which, on account of its dark colour, is distinguishable from the other groves thereabouts.

The other anchorage is about W.S.W. of Point de Agua $\frac{1}{2}$ mile distant, in 20, 25, and 30 fathoms, with a sandy bottom; but it is only in a case of the greatest emergency that one should adopt the resolution of anchoring in a place where the nature of the passage will render it impossible to beat out again, or for him to extricate himself.

Point de Agua lies about east of Point del Gada, and nearly 6 miles distant: it is high and sloped and to the S.W. of it, distant half a mile, there is a shoal of about the size of a long boat or launch, which, at low water, is even with the surface. Any vessel can pass between this shoal and the coast, as there are 8 fathoms water. Toward this part the coast is low and rocky.

To the S. 83° E. distance $2\frac{1}{4}$ miles from Point la Galera, is the middle part of the small island of Villafranca: it is high and sloped on the south and S.W. side, but to the S.E. it is low.

This small island has a little harbour which opens to the northward, and is capable of containing 4 or 5 small vessels: it has a sandy bottom, and at low water has only 2 feet depth at the entrance; and although farther in it has something more, yet the vessels always remain aground whenever the tide is out.

On the coast, at the north side of the aforesaid small island, is the town of Villafranca, on a beach which forms but a very small bight. The channel between the small island and the coast is of the width of 3 cables' length, or thereabouts, and is the principal anchorage of Villafranca: it has 10 and 11 fathoms water, sandy bottom, and the vessels moor north and south, with a hawser on shore on the small island, which, owing to its diminutive size, does not shelter from the winds and seas, from E.S.E. by south to S.S.W. The town of Villafranca is capacious, and water and all kinds of eatables are to be had there.

To the N. 81° E. distance 3 miles from the middle of the small island of Villafranca, is Point de Garza, high, sloped, and clear, the

coast forming two small bays.

To the N. 79° E. $2\frac{3}{4}$ miles from Point de Garza, is that of Lobeira, with a small island about 3 cables' length distance from it, between which and the Point any vessel can pass; this point is high and sloped, and between it and the former one the coast forms a bay, with a beach at the bottom of it, at the foot of the high land.

To the N. 83° E. $4\frac{3}{4}$ miles from Point Lobeira, is that of Fayan, high and sloped, and between both there is a large bay formed, on the N.E. end of which is the place that they have named "*la Poblacion*," and to the westward of this there disembogues a small river, which they call "*Agua Caliente*," because its water is actually warm: it has its source in a place, called "*Las Furnas*," where several springs of mineral waters having peculiar qualities are found. The whole of this bay has a good sandy bottom and anchorage, in case of great necessity, in from 10 to 30 fathoms. This part of the island is the highest, for from near the shore very high mountains indeed rear themselves, which go on descending towards the west, so that about the middle of them the island narrows, where it runs low and even, but elevates itself again in the western extremity, although not so much as to the eastward.

From Point del Fayan the coast continues to the eastward, edging away to the north until you come to Point la Marquesa, which is the most eastern one of the island, and is in latitude $37^{\circ} 48' 10''$ N. and longitude $18^{\circ} 55' 22''$ west of Cadiz, or $25^{\circ} 12' 22''$ W. from Greenwich. In the intermediate space are points Agua-retorta, Retorta, Matrucal, and Lomo Gordo, from the S.E. frontier of the island which is high and sloped.

To the north, three quarters of a mile distant from Point la Marquesa, is that called "*del Arnel*" which is lower than the former, and between them the coast forms a bay, the land high and rocky:—close to Point del Arnel is the small port of the same name; it is very bad owing to its being unsheltered and the bottom rocky.

Point de Riveira is the most N.E. one of the island. It lies to the N. $14^{\circ} 30'$ W. from the preceding one, distant upwards of three miles; it is of equal height with that, and between both there is formed a bay with sloped rocky land, in the middle of which there is a very remarkable glen, where a small river empties itself.

From Point Riveira the coast runs to the westward almost in a straight line, moderately high and sloped with several glens, until Point Nuestra Senora de la Ayuda, which is $7\frac{1}{2}$ miles distant, and in the intermediate space are found those of Lomba de San Pedro and Trambuida.

To the S. $82^{\circ} 30'$ W. distance 7 miles from Point Nuestra Senora de la Ayuda, lies that of "*del Citron*," which is a high slope ending in a low point. About mid-way between them is Point Maya, low and rocky land, with a ridge towards the north of the extent of a league, having 8, 9, and 10 fathoms water on it, where the heavy seas break. Between this point and that of Citron, another small point runs out, which on the eastern side of it forms a small angle that is called *Puerto Hermoso* with a castle for its defence. It is the best

to be found on the northern coast of the island, and only serves for boats, as the bottom is rocky.

N. 77° W. distant $11\frac{3}{4}$ miles from Point de Citron is Point Furada, between which there is a large bay formed. In this bay is to be found Point Riveiranda, and near to it on the S.W. side, the town of Riveira Granda, which is tolerably large, rich, stored with all kinds of provisions, and abounds with good water;—next comes Point Rabo de Pez, between which and the town there is a large strand, the only one at this north side of the coast, but so unsheltered that it is only practicable to land when the sea is very smooth. The inevitable loss which a wind on shore would occasion at this anchorage renders it unfrequented, and the inhabitants are in consequence obliged to have the manufacture and produce of this neighbourhood conveyed over land to the city of Point del Gada for the purpose of exportation. Moreover there are Points la Caleta, that of las Capelas, of Molfado, and of San Antonio, with a small island near the latter.

N. 65° W. $3\frac{1}{2}$ miles from Point Furada is that of Bretana, which is high, sloped and cut at the bottom, and is the northern point of the island. It is in latitude $37^{\circ} 56' 20''$ N. and longitude $19^{\circ} 33' 42''$ west from Cadiz, or $25^{\circ} 50' 42''$ west from Greenwich. Between the two points the coast is regular, sloped, and the land rocky, and in the intermediate space there is a small island near the shore.

Between Point Bretana and that of Ferreria (which is the first we treated of) is Point Matogos, which is low with small islands, and a ridge that runs out in the direction of the said point for about a league, having 2, 6, and 7 fathoms water on it with a rocky bottom, and ought to be guarded against when there is a heavy sea.

Between Point Bretana and that of Matogos, the land of the coast is high and rocky and rather inclining to form a bay, in which space, a little inland, there is a very sharp pointed mountain or peak called Mafa, and as it is remarkable it may be of great use towards ascertaining the identity of the said points.

Between Point Matogos and that of Ferreria the coast forms a bay, which contains the small islands of Mosteiros; the largest of these is high, sloped and smooth at its summit, with a hole through which the sea passes from one side to the other, and between this and the coast there are four smaller ones.

Close to point Matogos is the little harbour of Mosteiros, which only serves for boats, and there is a battery for its protection.

In the winter season, storms, with much wind and sea, dark and rainy weather, from north to west and south, are frequent in this as well as the other Azore Islands.

This island is the most considerable of the nine Azore Islands, from its extent, number of inhabitants, and produce. It contains 53,756 persons distributed in one city, five towns, and twenty two villages. Its soil is prodigiously fertile; it produces a deal of wheat, Indian corn, common and kidney beans, and sweet potatoes. It abounds likewise with black cattle, sheep, and hogs, which are very corpulent. Of wine, they have only enough for their own consumption.

Water and wood are to be found in abundance at several places ; but that which is most adapted for supplying large vessels with these articles, as well as provisions of all kinds, is the town of Punta del Gada, where there are a number of fishing vessels, that are very proper for the conveyance on board.

ISLAND OF ST. MARY. The eastern side of this island is high and broken, and the western low and even : on the former there are some mountains and peaks, the most elevated of which they call "*Pico alto*" (or High Peak.) The coasts are clear and very bold, and there is no risk whatever in approaching it in any part.

Point de Castelo is the most S.E. one of the island ; it lies in latitude $36^{\circ} 56' 47''$ N. and longitude $18^{\circ} 51' 42''$ west of Cadiz ; $25^{\circ} 8' 42''$ west of Greenwich. It is high and has a break, which forms a peak in the shape of a centry box. A vessel may anchor N. by E. of this point and close to it in 10 fathoms, sandy bottom.

N. 2° W. of Point de Castelo, $2\frac{1}{2}$ good miles, is that of Dos Cedros, which is likewise high, and between the two there is another point of little consideration, opposite to which lies a small, low rock distant from the coast from 3 to 4 cables' lengths, and is called "*Baja da Malla,*" or shoal of Mail ; between this and the coast, there is a free passage for all kinds of vessels with twelve fathoms water, at half flood in mid channel.

N. 32° W. $4\frac{2}{3}$ miles from Point dos Cedros is that of Dos Matos ; in the intermediate space the coast forms a bay, in which is found Point de la Feiteira and the small island and port of San Lorenzo. Point dos Cedros, that of la Feiteira, and the most outside part of the small island, are in a line in the direction of S. 38° E., and vice versa, at the distance of three miles and a half.

Point la Feiteira is high and remarkable when you are near to the coast. The small island of San Lorenzo is likewise high, and on the eastern side of it has a cave in which the sea enters, and there is sufficient depth and room for a boat to go in and remain sheltered.

The port of San Lorenzo is formed by the small island of the same name, and Point dos Matos, which points are distant from each other a good long mile. The bottom is sandy, and between the points there are 10 fathoms water which gradually augments towards the outside ; but it is necessary not to anchor in more than 20 fathoms, because from this depth upwards the anchorage becomes bad. Watering is very convenient in this harbour, by making hollows or pits in the sand on the beach, where the least excavation made by the hands produces water of the best quality. There are several houses and a church close to the beach, to all which they give the name of the "*Lugar de San Lorenzo.**"

Point dos Matos with that of das Lagoinas forms a frontier of three quarters of a mile extent, this last named being the most northern one of the island ; to the northward of which, about two cables' length distant, is the small island "*das Lagoinas.*" It is high and

*Lugar means at times town, at others city, but generally it implies village.

sloped like a mitre, and on being viewed on its parallel, it has at the bottom a small level point that runs into the sea a little way: between the point and the small island there is a rock, which prevents the passage being navigable for large vessels.

To the S. 82° W. of the Point das Lagoínas, three long miles distance, is the point of the small island "dos Frades," and in the intermediate space the coast forms a bay, and therein are the Points del Tamuschal, da Riveira, and de Cré; but in the whole of this space, and in that which follows as far as Port St. Mary, (or St. Maria) there is no anchorage whatever. At Point de Cré, the coast begins to descend in such a manner that the point of the small island dos Frades, may be considered as the commencement of its low part. This point has a cliff at the top of it, which, seen from some distance, appears separated from the coast. To the west of Point da Riveira is the river, wherein launches and boats can enter for the purpose of procuring water, wood, and provisions.

From the point of the small island dos Frades the coast continues to the west, edging away towards the south, until you come to Point dos Ponderados, which is the westernmost one of the island: in the intermediate space is Point del Furado, which is low, and has a ridge above water, extending about a cable's length from it, and whence to the west the coast continues low and uniform. Point del Cabrestante, between which and that of Furado is formed a bay and grounding place for boats and launches, called Puerto de Santa Ana, (or St. Anne's Port,) which is easily known by three or four houses and a battery, that are close to the edge of the shore. About N.N.W. of Point Cabrestante there is a small low island, called Maldebarca, and between it and the coast another smaller one, which renders this passage unnavigable for large vessels.

South 21° E. 2½ miles from Point dos Ponderados, is that of Chamusca, and in the interval the coast forms a bay, or bight.

From Point Chamusca the coast continues towards the S.E. unto Point Maldemarenda, and in the intermediate space is that of Pusan. About S.W. of this is the southern extremity of the small island of Riveira Seca, which stretches itself N.N.W. and S.S.E. is half a mile in extent, and 1 or 2 cables' length distant from the coast; but the channel formed by it is not navigable for vessels of much burthen. The whole of the western frontier of the island is low and uniform land.

About east, a long mile from Point Maldemarenda, is that of Marvan, and between the two is formed the Port of St. Mary's, where the town of the same name, the capital of the island, is to be found. The bottom is sandy, and in some parts rocky, with from 4 to 10 fathoms water. The rocky part is on the western shore, the eastern is the clearest.

A little to the eastward of Point de Marvan the coast begins to rise, and the said point is the commencement of a deep bay, which terminates in Point de Malbusca: this last lies three long miles to the S. 77° E. of that of Marvan, and the bay is divided into two parts by a black point that they call Point de Pedrera: the part from Point

Marvan to that of Pedrera is the most regular, and is called Figueral; and on the top of this piece of coast there is a remarkable rugged mountain, although not so high as those to the north of the island: the other part of the bay penetrates more into the interior, and has a beach at the bottom of it, therefore they call it "Bahia de la Playa," (or Beach-bay.)

Point de Malbusca is high, and two long miles towards the east of it is Point de Castelo, with which we commenced the description of this island: the intermediate space is a frontier of coast, high, sloping, and almost regular; it contains Point del Penedo de las Armas, which is nearly in a line with the other two, and opposite to it, two or three cables' length distant from the coast, there is a low rock, which they call "Baja del Sur," (or the southern shoal,) but you may near it on all sides, and pass between it and the coast with every sort or description of vessels.

Port St. Mary's is very unsheltered and exposed to the southern gales; on this account, only vessels of small tonnage anchor in it, and this in summer. To be ready and free in the event of any accident you must anchor to the S.E. of the Point of Marvan, opposite that part of the coast which they call Figueral. The best anchorage known by the pilots of the island is about a mile from the coast, in a direct line with the Points of Malbusca, and of the castle of the town of St. Mary's; so that the castle of the town of St. Mary's (which is at the south-westernmost part of it) do remain entirely open with Point Marvan. In this spot there are 36 fathoms water, with a sandy bottom, but at a short distance to the east of it the bottom is of a bad nature, as we found it to be in our researches. This circumstance it seems ought to decide in favour of Port San Lorenzo being the best anchoring place in the island. In either of them vessels can get refreshments; the same provisions are to be found as in the other Azore islands, and, in addition, an extraordinary number of partridges.

The Hormigas, or Ants, are some rocks which the navigators considered extremely dangerous, between the Islands of St. Mary and St. Michael, imagining that a great part of that space was strewed with sunken rocks, and therefore avoided passing between them; but having examined these dangers, it is proved that the whole of them are visible, centered and clear, and that vessels of any burthen may steer for them in order to pass on the north or south side, as may be most convenient.

The whole of these rocks run N. 5° E., and S. 5° W., a distance of about six cables length, including those separated. A heap of rocks through which the water scarcely finds entrance form the large island, from the middle of which we marked down Point de Castelo of the Island of St. Mary's, S. 24° 30' W. and the highest Peak of the said Island, S. 34° 30' W. and having, when very near to, and parallel with it, observed the latitude of 37° 17' 10" to our complete satisfaction, it was ascertained therefrom, and we consequently inserted the longitude of 18° 40' 10" west of Cadiz, or 24° 57' 10" W. of Greenwich. To the N. 5° E. of this greater island, there is a large round

rock, hollow on the south side of it, which may be from 10 to 12 yards high, it being the highest of all the Hormigas. The sailors called it *Hormigon*, as being remarkable among them and the first that is seen. When the Hormigas are viewed at a great distance off, they appear like a city, because the many inequalities in height have the resemblance of edifices. On the south side of the principal Hormiga, about a cable and a half distance, there is a shoal, part of which is above water, and the sea is seen to break over the rest of its extent; there are from 7 to 12 fathoms near about it, and in the channel which it forms 20 fathoms. The landing at the Hormigas is very difficult and exposed, because there is always a deal of sea and undertow.

The pilots of the Island of St. Mary agree that there is great depth of water about the Hormigas, and that there is only one shoal on the S.E. side that runs out a great way, but having examined it and sounded leisurely, with two or three on board, who were anxious to find the smallest depth of water, no less than 15 fathoms were found on it: this opinion has doubtlessly originated from the circumstance, that in a heavy sea it must rise very high on this shoal, on account of the depth of water near about it being much more considerable, even including that part which is in the direction of the Hormigas.

This island has a town and three villages, with 4192 inhabitants. Its principal productions are wheat and barley of the best quality, wine and cattle, but of the whole only enough for its own consumption; and seldom, even in the most abundant years, do they export any grain to Lisbon. It has water in abundance, wood, what is necessary, but it is small. With fruit and vegetables it is poorly stocked.

TERCEIRA ISLAND. This is the principal of the nine Azore Islands, as being the residence of the captain general, with the other chiefs, military and civil, entrusted with the whole charge of the government; and of the most illustrious bishop, with his ecclesiastical and cathedral cabildo, sufficiently competent for the observance of divine worship.

About the middle and southernmost part of this island, the mount of Brazil rears itself. It is tolerably high, and cut away at the bottom towards the sea, with two small columns or pillars at the top, which serve as look-out places, and descends gently towards the north, on the skirt of which is the citadel or castle of St. John, (or San Juan,) the chief defence of the whole island, and of the city of Angra, which place extends from it into the plain, and is where the captain general, bishop, and the rest of the government of the whole of the islands do reside. The aforesaid columns are in latitude $38^{\circ} 38' 10''$ N. and longitude $20^{\circ} 56' 40''$ W. of Cadiz, $27^{\circ} 13' 40''$ W. of Greenwich.

Anchorage at Angra. To the N. $41^{\circ} 30'$ E. distance six tenths of a mile from the highest part of the mount of Brazil is the castle of St. Sebastian, between which, and that of San Antonio, (which is at the extremity of the wall and batteries, that extend from the castle of San Juan round the skirts of the east side of mount Brazil,) is

the anchorage forming a bay towards the N.N.W. at the bottom whereof is the city and Mole, the latter being of dangerous access when there is any sea running.

Merchant vessels regularly anchor in the line of the castles of San Antonio and San Sebastian, or rather further in, mooring all fours, and trusting their security to their good anchors and cables, and holding ground; for, unsheltered from the winds and seas from the S.S. W. round to east, they cannot get out with these winds, which in the winter are generally violent; wherefore on the least appearance of them in that season, the crews abandon their vessels, which in spite of every precaution generally go to pieces on the coast, the whole of it being sharp rocks, with only a small beach that is of no manner of help to them.

Vessels of great burthen and all men of war anchor to the E. of mount Brazil in 30 or 40 fathoms water, with sandy bottom, and they ought to be ready to get under way the moment the wind appears coming from the S.E. or S.W. quarters.

At the foot of the castle of San Sebastian, towards the N. side of it, there is a very small beach somewhat sheltered from the sea, by a wall of the castle itself. They call it "Puerto de las Pipas," and is the spot where the fishing vessels are secured by grounding them on the sand. It may serve as a landing place when the sea will not allow you to land at the Mole.

The boats of the Island come off so soon as they see any vessel anchor, and by their means it is easy to get supplied, (even keeping under way, tacking in and out) with water, wood, and all kinds of provisions, of which there is great abundance.

The coast continues towards the E. unto the peak of Las Contien- das, remarkable on account of its advancing into the sea, and forming three peaks on its summit, several small points and bays, or bights all of rock, and a sort of beach. Between this and mount Brazil, almost at equal distances, are found the Cabras Islands, which lie S. 80°, 30' E, four miles distant from the highest point of the mountain, and two thirds of a mile from the nearest part of the coast. There are two of them, the eastern one is the largest and highest; on the southern side it is cut away at the bottom and descends towards the N. the shore of which is accessible: seen from the E. and W. it appears like a wedge. The western one is smaller and less elevated: they leave a channel between them large enough for row boats with from 8 to 10 fathoms water.

Through the channel that these islands form with the coast, any ship can pass, for there are 9, 12, and 13 fathoms water with a sandy bottom, and only near to the Islands or shore are there rocks to be found.

To the S. 60° E. $6\frac{1}{5}$ miles from the highest point of the mount Brazil, and S. 30° W. $2\frac{3}{4}$ miles from the peak of Las Contien- das, is the middle of the small Island, which they call los Frayles, (or the Friar's Island,) with two peaks of a pyramidal shape; it has a shoal to the S.E. about a cable's length distance, on which the sea breaks. The island is low with several cliffs, that at some distance

appear to be various small islands. Between it and the Cabras islands you may pass with all confidence, for there are 60, 70, and 75 fathoms water with gravelly bottom, and no hidden danger.

The eastern descent of the Peak of las Contiendas forms a point, tolerably low and sloped, called La Mina; close to which are four small islands.

About N.N.E. of Point la Mina, distant $4\frac{1}{4}$ miles, is that of St. George, low rocky land with a battery, the coast forming a bay, at the bottom of which is the town of Porto-Novo. It is entirely unsheltered, and the greater part of its bottom rocky.

To the N. $8^{\circ} 30'$ W. half a mile from Point St. George is that of los Baxios, which sends out towards the E. a ridge of about a cable's length extent, over which the sea breaks but slightly. A little farther from it there are 6 fathoms water rocky ground, which goes on increasing, so that a quarter of a mile from the point you find 12, 15, and 20 fathoms. In order to sail in from 6 to 7 fathoms water, you must bring the island farthest outside of the Point de la Mina, in a line with Point St. George, until you have got round the aforesaid Point of los Baxios. The continuation of the ridge, although of great depth, occasions a heavy sea in stormy weather, which therefore should be guarded against. We have the more strictly examined this reef, as M. Fleurieu (mis-informed by a pilot) asserted that the shallowness of the water extended to the distance of two leagues.

To the N. 6° E. distant $3\frac{1}{2}$ miles from Point St. George, is that of Malmerenda, the easternmost point of the island: it is high and very oblique, with a large shoal near to it that shews itself at low water. Between this and Point de los Baxios, there is a large bay with a beach formed, and a town at the bottom of it which they call *de Praya*, and all about it there are batteries of small force to defend this only accessible place in the island. This bay is clear with great depth and good holding ground. It is capacious enough for a fleet to anchor in, sheltered from the winds from south, by the west, round to north, but entirely open to those from the eastward, and therefore you should be always ready to get under-way with those winds, for which purpose the most eligible anchorage will be with Point Malmerenda, in a line with the small island of Caneiros;—and the tower or steeple of Santa Cruz (which is the highest and northernmost one of the town) remaining to the W. then you will be in 25 fathoms with sandy bottom, and completely free of every thing. At this anchorage supplies can be obtained of water, wood, and eatables, in the execution of which the boats of the place are very useful.

To the N. 27° W. $1\frac{3}{4}$ mile from Point Malmerenda is that of Canciros; the two points form a small bay of high, oblique, and inaccessible land. To the north of this about half a mile, is the small island of the same name, between which and the coast there is a passage for any vessel without any fear, unless it is the shoal to the E.N.E. of the point about three cables' distant, over which the sea breaks when there is a swell.

From Point de Caneiros the coast runs towards the W.N.W. unto

Point Rua Longa, which is the most northerly one of the island, with several small bays and points, but the whole extent of it is lost coast, full of rocks and several shoals; therefore do not come within a mile of it.

From Point de Rua Longa the coast continues to the west, but inclining somewhat southerly unto Point del Negrito, where it runs greatly to the south, forming a bow (or arch) unto that of Ruba, which is the most westerly point, and from this it continues in the same form, and edging towards the S.S.E. up to Point Gorda, the whole being oblique and inaccessible.

Near Point Gorda and on the N.N.W. side of it, there rises a small remarkable mountain called the Peak of Santa Barbara, with a look-out place on its summit.

From this peak of St. Barbara, the highest mount of Brazil lies S. $63^{\circ} 30'$ E. $8\frac{1}{2}$ miles distant: in the intermediate space are Points de las dos Riveiras, and San Mateo, the whole of the coast lost in the same way as the preceding part; nevertheless, the bay formed by Mount Brazil on the W. side, with Point de San Mateo, is lower, and more easy of access for boats, although with great difficulty. Towards this last point, the town of Angra extends somewhat. The bay we speak of is defended by some batteries.

The island of Terceira is mountainous, more so on the western side than to the eastward. It has a rugged mountain which runs almost E. and W., whose western extremity is the most elevated: it is called Santa Barbara, or de la Serreta. At a small distance from this, towards the E. it makes a great break, which plainly distinguishes this mountain from the others.

This island has 28,900 inhabitants distributed in a city, two towns, and fifteen villages. Its soil is very fertile, and produces more wheat than the island of St. Michael, wherefore it generally exports a quantity of that grain to Lisbon and the Island of Madeira. It has wines sufficient for its own consumption, although not of so good a quality as those of Pico; of every other grain and produce (including flax) they gather enough for their use, and a very tolerable proportion of potatoes.

Of black cattle, sheep, and hogs, as well as fowls, and other birds, rabbits, and other kinds of eatables, there are to be found sufficient for supplying vessels at very reasonable prices: and the fishery at Angra Praya, and all round the island, is very abundant, and of a good quality.

The facility of watering at Angra has already been spoken of, and the laying in wood is not expensive.

ST. GEORGE'S ISLAND. Point del Topo, which is the most S.E. one of the island of St. George, lies S. 76° W. distant $30\frac{3}{4}$ miles from the highest part of Mount Brazil, and is in latitude $38^{\circ} 30' 45''$ N., and longitude $21^{\circ} 35' 06''$ west of Cadiz, $27^{\circ} 52'$ W. of Greenwich. It is of a middling height with rocks all round it, and near on the eastern part of it is the small island of the same name, which is low, and likewise surrounded by rocks. One of these rocks is almost mid-

way between the small island and the point, but inside of it again there is a passage for any vessel.

From Point del Topo, the north coast of the island runs towards the N.W. as far as Point del Norte Grande, where there is a small town: in the intermediate space are Points de Vinas, and Norte Pequeno: between these there is a small bay, and in a break another little place called la Caldera.

North $60^{\circ} 30'$ W. $8\frac{1}{2}$ miles from Point de la Norte Grande, is that of Yoao Gonzalez; in the intervening space the coast is low and uniform. From Point Yoao Gonzalez the coast runs something more to the westward unto Point del Norte, all low and almost uniform or regular.

The coast continues afterwards forming a frontier, almost E. and W. as far as Point de Rosales, which is the north-western point of the island: it lies in latitude $38^{\circ} 44'$ N. and longitude $22^{\circ} 6'$ W. of Cadiz, $28^{\circ} 23'$ W. of Greenwich, and has several small islands in its vicinity, the most remarkable of which are two very high ones in the form of pyramids, one at the foot of the point, and the other to the S.W. of it, distant half a mile.

To the W. by S. of Point de Rosales the pilots of this island affirm that there is a shoal, with 7 fathoms water, rocky bottom; which can only be prejudicial by the breaking of the sea over it in a storm.

From Point de Rosales the southern coast continues towards the S.S.E. as far as Morro Grande, which is high, of a blackish colour, and has a look-out place on the highest part of it; in the intermediate space are Points de Monte Trigo and la Feiteira, the last with small islands at the foot; and the coast in the said space is pretty high.

To the N.W. of Morro Grande, and on its skirt, the coast runs in to the N.E. forming a small port, where some vessels have been lost on entering it through mistake, instead of the harbour of Velas; for although there is sufficient depth of water the bottom is all rocky, and once inside you cannot return with the same wind that took you there.

South $79^{\circ} 30'$ E. $1\frac{1}{2}$ mile from that Point of the Morro Grande which the sea washes, is Point la Caimada, rather low, with a small castle: between these two points is the bay, that the natives call the Port of las Velas, which harbour is sheltered from the winds from N. W. round by north to S.E. At the bottom of this bay is the town of las Velas, on the sea shore: it is the chief town of the island, and on the S.E. side of it there is a small mole, with 3 fathoms water, and rocky bottom. The regular anchoring place in this bay is to the S.S.E. of the said mole, in 9 fathoms, fine black sand. They moor with 2 anchors N.W. and S.E. The population is small, and there is not an abundance of water.

From Point la Caimada (which is the eastern one of Point las Velas) the coast continues low and rocky at the sea side, and high in land, towards the S.E. as far as Point de los Monteros, which is the S.W. point of the island, and is high and sloped. In the intervening space are Points de las Riveiras de Nagos, de las Manadas, de la

Caleta, and de Fayan, forming among them several little bays, but all of it is lost coast. On the east side of Point la Caleta (from whence a high mountain raises itself gently) and close to it, is the town of the same name, whence a great deal of wood is exported to the neighbouring islands.

Point los Monteros, with that of Topo, form the southern front of the island, being three miles in extent, the whole of the land tolerably high and sloping. In the intermediate space is Point de Monte Hermoso, between which and that of Topo there runs out a small low point, under shelter of which the coasting vessels are accustomed to anchor, and they call it Port del Topo.

The channel which this island of St. George's forms with that of Pico is of great depth and very clear, wherefore you have only to guard against what is to be seen. There is a strong current that goes in the direction of the channel, according to the state of the tide. All the channels which the nine Azore islands form among themselves are navigable; for, besides being clear and deep, they are so disposed, that a vessel can seldom be distressed by a wind on shore, if proper attention be paid.

This passage, between St. George and Pico, is the only one that should not be attempted but in settled weather, (or with a steady breeze) for a sudden calm might prove fatal.

This island contains 11,112 persons, distributed among three towns and seven villages. It abounds in wines of a good quality, which it exports to Terceira and North America. They have a great abundance of cattle of every kind, and carry on a traffic with them between Terceira and Fayal, therefore the whole are sold at very reasonable prices; and the cheese (of which there is a great quantity) is as good as that in England.

The wheat and Indian corn which it produces is only sufficient for the support of that part of the inhabitants who use it, for the lower class substitute in its stead the root of the Iname; water and wood it has in abundance.

ISLAND OF GRACIOSA. To the N. $49^{\circ} 30'$ E. distance 25 miles from Point Rosales (which is the north-westerly point of St. George's island) and N. $60^{\circ} 15'$ W. distance $29\frac{1}{4}$ miles from Point de Ruba (the most westerly of the island of Terceira) is Point del Carrapacho, being the south-easternmost point of the island of Graciosa, which is low towards the sea and with small islands, but a little distance inland it is high and craggy.

To the E.S.E. two cables' length from the above point, is the small island of Abajo, which is rocky and tolerably low, with other small islands in its vicinity: between this and the point there is great depth of water, insomuch that any vessel can pass, let her be ever so large, which we notice here, because in some cases it is convenient to go through this passage in order to gain the anchorage of Praya.

North 14° E. $1\frac{1}{2}$ mile from Point de Carrapacho, is that of Fanaes, which is tolerably high and cut away at the bottom; between these points the coast is almost uniform and clear: the aforesaid point is the southern one of the bay of Praya. N. 15° W. $1\frac{1}{2}$ mile from Point

dos Fanaes, is Point Negra, which is low and rocky land: between this and the former is the bay of Praya, with a town of the same name at the bottom of it, in the vicinity of Point Negra.

E.N.E. half a mile distant from Point Negra, is the small island of Praya, which is low on the west side of it, and rather higher to the east; between it and Point Negra there is room to pass. To the south of the said small island, distant about $1\frac{1}{2}$ cable length, is the anchorage of this bay.

North $21^{\circ} 30'$ W. distant 3 miles from Point Negra, the coast runs as far as Point de Josef Ferrer, which is very low, being even with the water, and has a shoal to the E.N.E. about 2 cables' distance, on which there is little depth. The coast between these two points is almost regular, with a few little bights, the first of which is close to Point Negra, and its northern part is a high slope that continues until near the Point of Josef Ferrer, where it forms another little bay of low land.

To the eastward of the southern extremity of the said slope, bringing the small island of Abajo in a line with the most westerly part of that of Praya, (but a little open, this line) is the mark for the best anchoring place of the whole island, in from 30 to 40 fathoms, sandy bottom. Here vessels load and unload with more convenience, and they are ready to be off with any winds, being sheltered only from south, by the west to north. All the goods from the town of Santa Cruz are brought to this anchorage to be shipped, as they have no other nearer.

North $71^{\circ} 30'$ W. $1\frac{1}{2}$ mile from Point de Josef Ferrer is that of Barro Bermello, which is higher than the former, and has small islands about $1\frac{1}{2}$ cable length from it; between these two points is the bay and town of Santa Cruz. The coast is low and the land rocky, with lumps of rock close to the shore. At the end of the bay, and over towards Point Josef Ferrer, is the town, which is the principal one of the island; very close to it on the S.W. side there are three small hills near each other, and a church on the highest part of every one of them, which may serve as a mark for knowing the island. In the aforesaid bay there is no anchorage whatever, as the ground is rocky.

From Point de Barro Bermello the coast runs N. $71^{\circ} 30'$ W. $1\frac{3}{4}$ mile, the land of equal height with the point unto that of Pico Negro, which is high, oblique, of a very black colour, and is the northernmost point of the island.

To the S. 40° W. 2 miles distant from Point de Pico Negro, is that of Fosso de Porco, likewise high, with rocks at the foot: between these points the coast forms very little of a bay, and the land is middlingly high.

South 10° W. half a mile from Point de Fosso de Porco, is that of Jorge Gomez, which is low and rocky land, nigh unto which there is a church; the coast rather inclines to form a bay between these points.

To the S. 29° E. $3\frac{1}{4}$ miles from Point de Jorge Gomez, is Point Blanca, which is very high and sloping, and at a very small distance

from it there is a mountain, which is the highest one of the whole Island. The coast between these points is of high rock, and forms but little of a bay, and close to Point Blanca is Point del Frayle, tolerably high, with a stone on its summit, that resembles a man.

S. $63^{\circ} 30'$ E. $2\frac{1}{4}$ miles from Point Blanca, is that of Folgo, which is very low and rocky land: the coast between these points forms a bay with a town at the bottom of it, that they call Folgo.

S. $85^{\circ} 30'$ E. $1\frac{1}{2}$ mile from Point de Folgo is that of Carrapacho, of which mention has already been made: between these points the coast is almost regular with two small low points that do not project much.

This Island is mountainous enough, and seen from the N.E. or S.W. at a great distance off, it appears like two Islands, because the mountains that are about Point Blanca, and those over that of Carrapacho, leave a space of low land between them, which the horizon of the sea hides from the sight.

This Island has 7315 inhabitants distributed in two towns and two villages. It is the most fertile of all the Azore Islands. In so small an extent it appears incredible the quantity it produces of barley, (of which the common bread of the country is made,) wheat, Indian corn, wine, and all kinds of fruit and vegetables, of which they export, all over and above their own consumption, to Terceira and Lisbon. Of sheep, hogs, and fowls, they have more than they can consume, and send some to other islands. The only scarce article there is wood, which it supplies itself with from St. George's and Pico Islands.

ISLAND of PICO. The point called de la Isla is the most S.E. one of the Island of Pico; it has a ridge to the east of about a cable's length extent, and lies in latitude $38^{\circ} 22'$ N. and longitude $21^{\circ} 50' 30''$ west of Cadiz, $28^{\circ} 7' 30''$ W. of Greenwich. It is tolerably low and sloping.

S. $80^{\circ} 30'$ W. five miles from Point de la Isla is that of Caleta, or of Nesguin, which is low near the shore and elevated at a little distance; between these points are comprised the small harbours of the Muelle de Manana and Nesguin, only fit for coasters, which they ground on the sand, as the bottom is completely rocky.

N. 78° W. $6\frac{3}{4}$ miles from Point la Caleta is that of Arrife, a little more elevated than the former; the coast between these points is rocky land, and forms a bay wherein is found Port de las Riveiras, which is only practicable for the coasting vessels of the trade of this Island.

N. 77° W. distant 8 miles from Point de Arrife, is that of Santa Catalina, and in the intermediate space that of del Misterio de San Juan; between which and Point de Arrife is the lake and town of Lagens; the lake communicates with the sea by means of a bar, over which the coasting vessels enter at high water. The fishermen have another sheltering place in the Port of Praina, which is nigh to and on the N.E. part of Point de Santa Catalina.

From Point de Santa Catalina the coast runs to the N. $62^{\circ} 15'$ W. $3\frac{3}{4}$ miles unto Point de Espartal, all low, with small Islands and rocks close to it. In this intermediate space is the Port of San Mateo,

distant one mile from the point of Santa Catalina; it is only fit for fishing boats.

The coast inclines towards the north from Point de Espartal to that of Pié del Monte, which is the most western point of the island, and is in latitude $38^{\circ} 26' 15''$ N. and longitude $22^{\circ} 19' 15''$ west of Cadiz, $28^{\circ} 36' 15''$ west of Greenwich. The intermediate coast and the point itself are of low rocky land; but from the point, the land gently rises until it forms a small mountain, that they call the Fucino do Pico.

The coast continues from Point del Pié del Monte, forming in an arch the N.W. front of the island, until you come to Point de los Baxios, which is in latitude $38^{\circ} 32' 45''$ N. and longitude $22^{\circ} 17' 40''$ west of Cadiz, $28^{\circ} 34' 40''$ W. of Greenwich.

From this point a reef of rocks runs out to the extent of half a mile towards the N.W.: when there is a gale you should not pass within a league of this point, as the breakers extend to almost that distance.

About mid-way between Points del Pié del Monte and de los Baxios, and on the most prominent part of the coast, is the port and small islands of la Magdalena. The port of la Magdalena is reduced to a very small bay, wherein is a town. Here they ship off the greater part of the produce of the island, for Fayal, in small row-boats.

N. 71° W. half a mile from Point de la Magdalena, are the islands of the same name. They are high and sloping, the most northerly one is the smallest; they run one with the other N.E. and S.W., the distance of two-tenths of a mile; are surrounded with rocks, but very close to them there are 6, 7, and 8 fathoms water, rocky bottom; and the depth increases between them to 10, 12, &c. Between them and the coast, however, there is only a channel for feluccas, with 3 and 4 fathoms water and rocky ground.

From Point de los Baxios, the coast edges towards the east, unto Point del Cabrito, from whence it stretches still more to the S.E. with several points and small bays, all rocky land, until it meets Point de la Isla where the description began, without any thing remarkable, the whole of this part of the coast being rude, and affording no shelter whatever unto vessels.

Of the height of the peak and its description, we shall treat in the following account of the island of Fayal, because it was in this island, that the geometrical operations were carried on for the purpose of determining it.

This island has 20,861 inhabitants, distributed in three towns, and eleven villages. Its crop of grain is very scanty, the soil being so rough and full of large stones that it does not admit of sowing them, and so the greater part of the wheat and Indian corn for its consumption is brought from the neighbouring islands, and the poor people substitute the Inames, of which there is an abundance. Wine is the staple commodity of the whole island, the greater part of which is of an excellent quality, and such as is not they reduce to brandy: this they can the more readily do, from the plenty of wood that is every where to be found. The annual produce of the vintage generally amounts to twenty thousand pipes, of which a great part both of wine

and brandy is carried to Brazil, and a large quantity of it is also exported to England, it being very much like the Oporto wine which is in great estimation among the English.

They have more black cattle and sheep than they can consume, and a great abundance of fruit, the whole of an excellent quality.

The vestiges of four volcanoes, which they have had at different places and periods, are visible:—one of them is the peak itself, whose vertex is a cauldron, that the natives say is seen to emit smoke frequently:—we saw it several days, from day break to sun rise, when the clearness of the atmosphere afforded an opportunity of observing it with a good glass, to our entire satisfaction.

In the year 1719, this or one of the other three volcanoes, threw out a prodigious quantity of pumice stones, which the currents carried away between the islands of Terceira and St. Michael; whence arose the story (that is pretty well spread among navigators) of an island of great extent, and about sixty fathoms high, having appeared and afterwards vanished. They add, that the vessels which wished to make the said island, desisted from their intention, because the heat was so excessive that it melted the pitch. A rare and prejudicial propensity writers have in general, to believe, without inquiry, every thing that is marvellous, let it be ever so inconsistent, by way of winding up and adding an amen to their works.

ISLAND OF FAYAL. The small mountain of Nuestra Senora de la Guia, of a tolerable height and lying N.N.W. and S.S.E. with a hermitage on its summit, is the most S.E. land of the island of Fayal. It is in latitude $38^{\circ} 30' 55''$ N. and longitude $22^{\circ} 25' 48''$ west of Cadiz, $28^{\circ} 42' 48''$ west of Greenwich. On the north side it is united by a neck of sand, with another smaller mountain of a black colour, which is called Caimado, and is where the town of Orta takes its rise. To the westward of this town and near Mount Caimado, there is a bay with a beach that they call Port Pin, where some small vessels are accustomed to load and discharge their cargoes when the weather is fine, for, with the wind from the S.W. quarter, they are very much exposed.

S. $86^{\circ} 30'$ W. distant $3\frac{3}{4}$ miles from the hermitage of Nuestra Senora de la Guia, is the point of Santa Catalina, which is very low and rocky land of a black colour, and it likewise has a hermitage. In the intermediate space is Point de la Feiteira, of a middling height and sloped, and to the eastward of it there is a small bay of the same name, with a beach and town; the eastern point that forms this bay is low. There are some small islands very near, and a cave which serves as a mark for the shoal of the harbour of Fayal.

N. 70° W. $1\frac{1}{2}$ mile from Point de Santa Catalina, is the headland of Castelo Blanco, which is a round little mountain of a middling height, sloped on every side of it, and united on the N.E. with low land, that causes it to resemble an island at a distance. Between these points, the coast is tolerably high and rocky land, and forms a bay.

From the headland of Castelo Blanco, the coast runs towards the N.W. unto Point del Cumplido, which is low at its extremity, although soon afterwards it rises high. It is the most westerly land of the is-

land, and is in latitude $38^{\circ} 35' 10''$ N. and longitude $22^{\circ} 36' 45''$ west of Cadiz; $28^{\circ} 53' 45''$ west of Greenwich. In the intervening space are Points de Ultimo, (which with Castelo Blanco forms a bay, the land being high, oblique, and cut away almost at the bottom) and that of Baxio de Figueiras between the latter and Point del Cumplido.

On the north side, one-third part of a mile from Point del Cumplido, are the Capelinos islands, which are two in number, of a tolerable height, not very large, but one of them larger than the other. They run, one with the other, N.N.W. and S.S.E. The channel between them and the coast is only navigable in fine weather for fishing boats.

From Point del Cumplido the coast begins to run towards the east up to that of Jorge Lorenzo, which is the most northerly point, and is in latitude $38^{\circ} 38' 15''$ N. and longitude $22^{\circ} 29' 45''$ west of Cadiz; $28^{\circ} 46' 45''$ west of Greenwich. It is high, sloping, and cut away towards the bottom. In the intervening space, and about a long mile from Point del Cumplido, is that of Norte Grande, with a small island close to it. The coast forms a large bay between the latter and Point Jorge Lorenzo; the land is high, oblique, and cut away towards the bottom, with some small points of little note.

The coast continues towards the E.S.E. from Point Jorge Lorenzo to that of Riveirina, which is the N.E. point of the island: it is high and sloped, and forms a round front of about half a mile extent. At foot of it there runs out a low point, with three small islands close to it. The intermediate coast is almost regular, and forms Points de Escalinas and de la Pesqueira.

S. 11° W. $2\frac{3}{10}$ miles from Point de Riveirina is that of Yoao Diaz, which is low, rocky, of a black colour, and has rocks at its extremity. Between these points the coast inclines a little towards a bay; the land is high and oblique, and about the middle of it there is a remarkable slope, of a red colour, that serves as a mark for the shoal of Fayal.

S. 2° W. nine tenths of a mile from Point de Yoao Diaz is that of Espalamaca, high and sloping, with a small round front, which has a look-out place at its summit. Between these points there is somewhat of a deepish bay, with a beach at the bottom of it, and a church. When the trading vessels from Port de la Magdalena (in the island of Pico) to Fayal are assailed by violent winds from the southward, they find, on bearing up, a good shelter in this bay.

The Point of Espalamaca is the northernmost one of the bay in which the town of Orta is situated, the most southerly point being that of Nuestra Senora de la Guia, which run, one with the other, to the S. $27^{\circ} 30'$ W. and vice versa, distant $1\frac{8}{10}$ mile. The said bay runs in towards the N.W. $\frac{7}{10}$ mile, and at the bottom of it there is a large beach of black sand, which begins near Point de Espalamaca. and finishes in Mount Caimado; in this extent the town of Orta stands and about the middle of it there two very remarkable buildings, and nearly alike: one of these is close to the sea-side, and is what used to be the College of the Company; the other is to the most westerly part of the city, upon an eminence, and is the Carmelite Convent;

they lie with each other N. 42° W. and vice versa, and serve as a mark for the shoal of Fayal, which is situated to the S. 11° 30' E. $2\frac{1}{10}$ miles from Point de Espalamaca, and to the S. 65° E. $1\frac{6}{10}$ mile from the Hermitage of Nuestra Senora de la Guia. The said shoal has 22 Castilian feet depth in the most shallow part at low water, and it lies N.N.E. and S.S.W. twenty fathoms extent, being about ten broad. Its marks are the following:

1st.—The spire of the Company's College, with the north corner of the Carmelite Convent. 2d.—Point de Yoao Diaz with the middle of the red slope, which, as has been already said, is between this point and that of Riveirina; or rather, the most southern part of the mountain of Nuestra Senora de la Guia, with the cave that is on the eastern point of the bay of la Feiteira.

Supposing the situation of the said shoal and its marks, already known as pointed out, you must now observe that the regular anchorage of this island is opposite the town of Orta, that is (as before stated) in the bay formed between Point de Espalamaca and the mountain of Nuestra Senora de la Guia. It is the best anchoring place of the whole of the islands, as well on account of the facility of its entrance, as of the shelter it affords, excepting from the winds from the N. to the N.E. and from S.E. to S.W. particularly in winter time, when the S.E. wind is very destructive, it being right in. Whoever has an intention to anchor, so as to be ready to make sail so soon as those prejudicial winds may set in (which is the safest method) will let go the anchor in 35 or 40 fathoms, sandy bottom, opposite to the town, about a mile and a quarter distant; which will be on having a little open the Point de Yoao Diaz (the northern point of the bay of Praya) with Point de Espalamaca, and taking care that the line of the two buildings of the Company and the Carmelites be somewhat open also, leaving the first on the south side. From this spot you can go out with all winds, even although it be S.E. and a fresh gale.

In summer time the general anchorage is where the line of the two buildings is open, that of the Company remaining always to the south, and the Point de Riveirina just shut in with that of Espalamaca, in which place there are 25 fathoms water, sandy bottom. This is meant for large vessels, for the small ones anchor nearer to the town in 15 to 20 fathoms.

You can likewise anchor opposite the bay of Praya, keeping the mount of Nuestra Senora de la Guia a little open with Point de Espalamaca, in 25 or 30 fathoms, sandy bottom. All the ground from the middle of the channel, formed by the two islands of Fayal and Pico towards that of Fayal, is of sand and small shells, excepting at the Point of Espalamaca, which in its direction unto the islands of la Magdalena, although sand is to be found on the surface, underneath there is rock, and therefore it is not proper to anchor within that space. The same thing happens from the Point of Nuestra Senora de la Guia as far as the shoal, which, all round about it, to the distance of 4 cables' length, is of a rocky bottom.

Remarks for the Entrance into Fayal.—If on being near to this anchorage, on the S.W. side of it, the wind should be dying away from the eastward, and you intend to tack in order to gain the anchorage, you must be careful to keep over on the island of Pico, within the distance of a mile or a mile and a half, because a little farther out the bottom begins to be rocky, and consequently you could not anchor there in case of necessity; besides by so doing you will be free from variable eddy winds and calms, which the height of the mountains commonly occasion, but the coast is sufficiently clear.

Coming in on the tack with the wind from the west or north-westward, and standing for the anchorage, you must take care not to bring the marks above-mentioned in a line, in order to avoid striking on the shoal.

With a free wind the regular passage is between the shoal and Mount de la Guia, although there is no obstruction in passing between the shoal and the island of Pico.

Coming from the north side of it there is no occasion to be afraid of any thing, because every thing is clear, and you may steer for the anchorage without any care whatever.

On the days of a new and full moon it is high water at half-past twelve in the afternoon, the tide rising eight feet on springs, and only five at the neaps. When the tide flows it runs in this channel in a N.E. direction, and when it ebbs to the S.W.: its greatest velocity is three miles an hour.

The whole of this island is mountainous, and the greatest elevations are nearly in the centre, where there is a circle of high mountains linked together, which totally occupy a large space of ground, called with propriety La Caldeira (the Cauldron.) The highest part, or the mouth, is a league in circumference; and the bottom, which is a level circular surface, more than half a league. This plain, as well as the interior skirts of the mountains, preserve during the whole of the year a most delightful verdure, of material benefit to the cattle; because the water which almost the whole of the mountains of the island receive when it rains, and afterwards restore in springs, runs to the Caldeira, from whence arises the prejudicial want of springs throughout the island. This defect is, however, made up by the wells that yield water of a very good quality, particularly for shipping, which can easily get supplied from the wells that are very near the sea-shore.

On the beach of the black sand that is opposite to the town of Orta, at the foot of its walls, we measured a base of the greatest possible extent at low water, and from its extremities we measured, with the theodolite, the angles to the hermitage of Nuestra Senora de la Guia, and the look-out place of Point de Espalamaca, by which means we found the distance between these two points, from which we measured the angles to the highest point of the Peak, (which is very well terminated) and deduced the distances of the said hermitage and look-out place to the cuspide, which was transferred to the southern extremity of the measured base. With the distance of

this extremity of the base to the highest point of the mountain, and its angle of elevation above the horizon, measured to the greatest exactness with a quarter of a circle of $2\frac{1}{2}$ feet radius, it was found that the vertical height of the peak, above the level of the sea was $2935\frac{1}{3}$ Castilian varas, equivalent to 2686 English yards.

The tangent of the highest part of the peak to the horizon of the sea was found to be 32 maritime leagues; it follows therefore, that it can be seen from this distance on a clear day; for although in this point, if the sight were on the very horizon, the eye would only have the highest part of the peak before it, which would be imperceptible; still in being on the deck of any vessel whatever, the eye being more elevated, would enable a person to discover a greater part of the peak, and consequently it would be visible.

The mountain, that is formed by the peak, occupies the whole of the west part of the island; it is of a conical figure, the vertex of which is a sharp point; its skirts and even half way up are covered with vines, the next fourth part of it is occupied by shrubs, and the last and highest part is all rock, covered with a very short grass. It is a very remarkable object to behold a mountain of such magnitude rise from the surface of the sea, and without intermission rear itself to such a height.

The greater part of those who speak of the peak, say that it is inaccessible, and the figure under which they represent it causes this to be believed, but it is not so; as a proof of which, two of our officers ascended it as far as the foot of the last peak or sugar-loaf, which forms its vertex, with the intention of going up to the top, and with the theodolite (that they carried with them,) mark the remarkable points of all the islands; but this useful operation was prevented by the clouds enveloping the highest part of the mountain, as happens very frequently. On their passage up, they passed one night in great caverns, which there are about two thirds of the way up, where they found abundance of water that drops into them from the highest part of the mountain.

Fayal has 16,295 inhabitants, distributed in one town and nine villages; it produces wheat and Indian corn, sufficient for itself and part of the island of Pico. The cattle that is reared here are not sufficient for its consumption, but it gets easily supplied therewith from the island of St. George, which (as has already been stated) breeds a great number. The annual produce of wine in this island is very scanty, and the reason why some writers speak of its abundance and excellent quality, is because the rich people of Fayal are owners of the best vineyards of Pico, and so soon as they have gathered the produce and reduced the proper quantity to brandy, they bring over these liquids to their own houses at Fayal, whence they ship them to sundry parts of Europe and America. Here is a good supply of wood with what the island itself produces, and what they procure from the island of Pico; with respect to watering vessels, it has already been stated, that there is good water for voyages to be got from some wells near the sea shore.

ISLAND OF FLORES. Point Delgada is the most northerly one

of this island, of a middling height, smooth on its summit, not very projecting, and from its foot towards the N.N.W. there run a cluster of small islands, to the distance of about a quarter of a mile, which are clear all round them. This point is in latitude $39^{\circ} 33' 00''$ N. and longitude $24^{\circ} 52' 15''$ west of Cadiz, $31^{\circ} 9' 15''$ W. of Greenwich.

S. 59° E. $2\frac{1}{3}$ miles from Point Delgada is Point Ruiva, which is high, sloped, rugged, and obtuse, with a small island at its foot; between which points the coast forms a large bay, the land being tolerably high. Close to Point de Ruiva there is a small island that they call Pan de Azucar, or Sugar-loaf, (between which, and the land, only a fishing boat can pass,) opposite to which is the anchorage of this bay, sheltered only from the winds from S.E. by the south, to W.S. W. in 25 fathoms sandy ground. The vessels that anchor in this bay, are generally such as the above winds oblige to leave Santa Cruz, or are in want of water.

S. 29° E. $2\frac{3}{4}$ miles from Point de Ruiva is that of Santa Cruz, which is low and rocky land, with rocks close to it: in the intermediate space is the small island of Alvaro Rodriguez very near to the coast, to the E.S.E. of which there is anchorage in 36 fathoms sandy bottom, sheltered from the W. and S.W. winds; between these two points the coast forms a bay, the land being all high with several glens, excepting in the vicinity of the point of Santa Cruz, which is low. From this last point the coast runs to the south, a distance of three quarters of a mile, as far as the castle of Santa Cruz, which is very close to the town of the same name, it being the principal one of the island, and where they ship its produce to the others. The point of Santa Cruz is the most easterly point of the island of Flores, and has several times been brought in a line with the westernmost part of Corvo, to the N. 3° E. of the world.

To the S. 21° W. $1\frac{3}{4}$ mile from the castle of Santa Cruz, is Point Cabeira, low and rocky land, which goes on ascending very gently, so that at the distance of a mile, the land is high. Between these two points the coast forms a bay towards the west, with a beach and a small river at the bottom of it. This bay is the principal anchoring place in the whole island, and is sheltered from the winds from N.N. E. to S.W. You cast anchor in 35 or 40 fathoms sandy ground, which is the nearest anchorage to Santa Cruz, and on this account it is the most frequented by the vessels employed in the trade of this island.

S. $30^{\circ} 30'$ W. $1\frac{1}{2}$ mile from Point Cabeira is that of Loma, which is high and oblique; between these points the coast forms a bay, with a beach and small river at the end of it. You can likewise anchor in this bay, in 25 fathoms, sandy bottom; but it is not so well sheltered as the preceding one, it being open to easterly and southerly winds.

From Point de Loma the coast continues towards the S.S.W. unto that of Lagens, from which there runs out to the S.E. a ridge of rocks even with the water, to the distance of $1\frac{1}{2}$ cables length, and in the intermediate space is Point del Capitan.

S. $14^{\circ} 30'$ E. $2\frac{1}{2}$ miles from the Point of Lagens, there is a shoal, which according to the pilots of the island, has $4\frac{1}{2}$ fathoms water on

it. It is about the size of two ships, and appears like a large white flag stone when near to it. Between it and the coast there is a great depth of water, and the same round about it.

Between Point del Capitan and the aforesaid Point of Lagens, the coast forms a bay, the land being rocky, and it has a watered glen at the end of it, close to which is the town of Lagens with a large church that is very visible.

In this you can anchor very well with the winds from N. to S.W. by W. in 25 fathoms sandy ground, and this anchorage is much frequented, because in bad weather they can get under way more easily than at Santa Cruz, as having better beating room to work out.

From Point de Lagens towards the west, the coast begins to heighten until you come to Point de Roca alta, a little distance from which, towards the north, is the highest part of the whole island. All the interior of the island is very high.

S. $85^{\circ} 30'$ W. a little short of a mile from Point de Lagens, is that of Lope Vaz, which is low at the sea side, but at a very small distance it becomes high and sloping land. This is the south point of the island of Flores. N. 81° W. $1\frac{1}{2}$ mile from Point de Lope Vaz, is that of Roca Alta, which is cut away at the bottom, obtuse, very high and sloping, and of a black colour. Between this point and the former the coast is almost straight; being rocky, very high, and rugged land.

N. 72° W. one mile from Point de Roca Alta is Point de los Isleos de Agua Caliente, which is low and rocky land. It is called by this name on account of a mineral spring, which yields the water so hot that a person can scarcely bear his hand in it. Between these points the coast forms a bay, in which there is anchorage in 25 fathoms, with sandy bottom. The said point has sundry little islands at the foot of it.

N. $25^{\circ} 30'$ W. $1\frac{1}{3}$ mile from Point de los Isleos de Agua Caliente, is the point and small islands of Cantarinas, of the same height as the preceding one, and between them the coast is all rocky, and inclines a little to a bay.

N. $30^{\circ} 30'$ E. $1\frac{3}{4}$ mile from the small island of Cantarinas, is Point do Bredos, high sloping land, of a whitish colour, and with small islands at the foot of it. One of these, which lies on the south side of the point, resembles a column. Between this point and the preceding one, the land is rocky, of a middling height with a cascade of water, and the coast forms a bay in which you can anchor in 20 or 25 fathoms sandy ground; they call this bay "Riveira Grande."

N. 4° W. $2\frac{3}{4}$ miles from Point de los Bredos is Point del Baxio, which is very low, but at a little distance the land is high: between this and the former point, the land is entirely rocky, and the coast forms a bay that is called Cantario Grande, in which you can anchor in 32 fathoms sandy bottom, sheltered from the winds from N.N.E. east and south.

As to Point del Baxio (although it is called by this name) there is no occasion to be afraid of its vicinity, because there is nothing dangerous but what is to be seen. There is a very remarkable

church close to it, dedicated to St. Peter. N. 6° E. $2\frac{1}{3}$ miles from Point del Baxio, is that of los Fanaes, not very high towards the shore, but directly it becomes mountainous of a black colour; between these two points the coast forms a bay, and at the end of it there is a small island very close to the land. There is anchorage in the said bay, which is called the bay of San Pedro, in 25 or 30 fathoms, sandy bottom, and vessels can water here with great conveniency at a cascade that falls from the mountains, by carrying a hose to fill the casks, without taking them out of the boat.

N. 73° W. a long mile from Point de los Fanaes, is the small island of Monchique, between which and the coast any ship can pass.

N. $20^{\circ} 30'$ E. $1\frac{3}{4}$ mile from Point de los Fanaes, is that of Albornas, which is tolerably high, sloped, and red coloured land, and in the intermediate space is the small island of Maria Gadella, very high and round, to the W. by S. of which there is anchorage in 30 or 40 fathoms, sandy ground.

Between Point Albornas and Point Delgada, of which mention has already been made, the coast is all rocky, and inclines a little towards forming a bay.

N.B. It is to be observed, that in the anchorages of which mention has been made, it is understood for the vessel to be a little more than a mile from the land, because very close to it the ground is rocky, and a great deal farther out it is of the same sort.

The island of Flores is very mountainous, being much more so on the south side than to the northward. About S.E. and N.W. with the town of Santa Cruz, there is seen a remarkable peak in the interior of the island: it is very much cultivated, and verdant in every place that is susceptible of culture, and it has an excessive quantity of water which runs down in cascades every where from the heights.

This island has 7,005 inhabitants in two towns and four villages. Its produce is Inames, of which they make a great use, wheat of an excellent quality, and a deal of black cattle, sheep, and hogs, which enables them to make good cloths and woollen stuffs. Their exports are wheat, the cloths already mentioned, bacon, and a kind of grass or moss called orchilla, that yields the scarlet colour, and is held in great estimation in England, Holland, and the other countries where there are manufactories. It is found clinging to the rocks and declivities, and is gathered with the greatest trouble and danger.

There is a great abundance of cattle and domestic birds, at very low prices.

Of its abundance of water and facility of getting supplied, mention has been made; the same happens with regard to wood.

ISLAND OF CORVO. N. 28° E. $8\frac{3}{4}$ miles from the most northern point of the Island of Flores, (Point Delgada,) is the southern point of the island of Corvo, which they call Pesqueira Alto. It is very low and rocky land, and is situated in latitude $39^{\circ} 40' 45''$ N. and longitude $24^{\circ} 46' 45''$ west of Cadiz, $31^{\circ} 3' 45''$ W. of Greenwich.

In the channel formed by these two islands, there is a great depth of water; it has no shoal whatever, nor is there any hidden danger,

therefore all kinds of vessels can pass through it in any sort of weather,

N. 78° E. $1\frac{1}{3}$ mile from the Point of Pesqueiro Alto is Point de Puerto de Casa, of a middling height; between which points the coast is almost regular. Close to this point on the north side of it is the anchorage called de Casa, in which you may anchor in 25 or 30 fathoms, sandy bottom, and good holding ground.

From Point de Puerto de Casa, the coast runs almost N. 16° E. to the distance of $2\frac{2}{3}$ miles unto Point do Pico de Yoao de Moira, which is the northernmost one of the island. The whole is high, oblique land, with somewhat of declivity towards the sea.

S. $80^{\circ} 15'$ W. $1\frac{1}{3}$ mile from Point de Yoao de Moira, is that of Turrais, which is likewise high and sloping; between these points the coast is regular, and about mid-way there is a rock, a cable's length from the land, over which the sea breaks.

S. 38° W. $1\frac{1}{3}$ mile, from Point dos Turrais is Point Blanca, which is much higher than the former; between them the coast is regular, very high, and with some declivity towards the sea.

S. 13° E. $1\frac{2}{3}$ mile from Point Blanca, is that of Pesqueiro alto, of which we have before spoken; the coast between these points forms a bay, at the end whereof there is a small beach, and joined to this a little island, of the height of a ship's mast; to the W.N.W. of which there is anchorage in 30 fathoms, sandy bottom, and good holding ground, sheltered from the easterly winds.

The island of Corvo is very high, and at each extremity it has a mountain; on looking at them from some distance, they appear only one, but when viewed from N.W. or S.E. they are like a horse's saddle.

The anchorages are superior to those of the island of Flores, as far as being better holding ground.

This island has 738 inhabitants in one district; its produce is wheat, (which is the best of all the islands,) rye, and yunsa, of which they make bread mixed with the rye. Black cattle, sheep, and hogs are more abundant than the smallness of the island would lead to expect. Water and wood are both very scanty.

DIRECTIONS for the ENTRANCE of the ENGLISH CHANNEL.

Ships having passed on either side of, or through, the Azores or western islands, may shape a direct course towards the Lizard, inclining either to the northward or eastward, according to the wind, and other circumstances. If the wind incline to the northward, which is frequently the case from January to May, it is advisable to get into the parallel of $49^{\circ} 25'$ or $49^{\circ} 38'$ N. before they reach the meridian of Cape Clear; and to keep in that parallel until they have passed the Scilly islands; but if it should incline to hang in the southern quarter, it will be proper to steer somewhat to the eastward of the direct course. In either case it will be necessary to sound frequently, unless the longitude can be well ascertained by lunars or chronometers.

If, on approaching the entrance of the channel, the wind has been blowing from the south or S.W. quarter, allowance must be made for a current, which will be found setting obliquely across from Ushant to the westward of Scilly, towards the south west coast of Ireland, denominated Rennell's current; by which many ships have been driven to the northward of what they deemed a safe parallel, and found themselves, on approaching Scilly, in the parallel of, or to the northward of these islands, when they expected to have been to the southward of them.

Although the soundings off the entrance of the channel should not be entirely depended upon, yet it is certain that the ground near Ushant, to the westward, and near the French coast, in the channel, is much coarser than that in mid-channel, or upon the coast of England. In the parallel of, and to the northward of Scilly, within 8 or 10 leagues of it, the ground is generally ooze, but in the fair way of the entrance in latitude $49^{\circ} 20'$ or $30'$, there will generally be found fine sand, intermixed at times with small black specks, or broken shells; and this seems the most eligible parallel for a ship whose longitude has not been ascertained.

In and near the parallel of $49^{\circ} 25'$, in longitude $10^{\circ} 3' W.$ there are 80 fathoms water, fine white sand, with black and yellow specks; this is near the outer edge of the bank, and about 50 leagues from the meridian of Scilly. In the same lat. and in long. $9^{\circ} 11'$, there are 90 fathoms, fine white sand; 4 or 5 leagues farther eastward, 82 fathoms; and in long. $8^{\circ} 26'$ there are 77 fathoms, fine sand, and bits of shells. Seven or eight leagues farther, are 76 fathoms, fine white sand, and black specks; and in the space of 15 or 16 leagues more to the eastward, there are 60, 67, and 63 fathoms, shells and small broken stones; the latter depth is about $9\frac{1}{2}$ leagues S.W. by W. from St. Agnes' Scilly. St. Agnes' Light house is a magnificent and commodious structure, and, being plastered white, is an excellent day mark for ships to the southward of it: by night it is easily known by revolving on an axis, by which the light is obscured for a time in each revolution. Being abreast of Scilly, at the distance of 5 or 6 leagues to the southward of it, the course to the same distance off the Lizard is E.S.E. by compass, and the distance about 15 leagues.

The Lizard lights are conspicuous in clear weather, especially since they have been lighted with Argand lamps: they bear from each other W. $8^{\circ} N.$ and E. $8^{\circ} S.$ by compass. The Lizard may be approached in the day, with clear weather, to the distance of 2 miles. From the Lizard to the Start the compass course and distance are E. by S. $20\frac{1}{3}$ leagues; from the Start to the Bill of Portland E. $\frac{1}{4}$ S. 49 miles; from the Start to St. Catherine's point E. by S. 92 miles, and thence to Beachy Head E.S.E. $\frac{3}{4}$ E. 60 miles.

The mid-channel course is E. by S. and W. by N. by compass.

For further instructions in this navigation, the reader is referred to the *Directions accompanying the Chart of the English Channel.*

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