Sailing Directions

FOR THE

COASTS

OF

SPAIN & PORTUGAL,

FROM

CAPE ORTEGAL TO GIBRALTAR.

LONDON:
Published by C. WILSON,
(Late J. W. NORIE & WILSON,)
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157, LEADENHALL STREET, E.C.

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ORIGINALLY COMPILED

By J. W. NORIE, Hydrographer,

AUTHOR OF A COMPLETE EPITOME OF PRACTICAL NAVIGATION,

AND OTHER NAUTICAL WORKS.

A New Edition,

REVISED AND CORRECTED TO THE PRESENT TIME,

By J. S. HOBBS. F.R.G.S.,

HYDROGRAPHER.

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N.B.—Alterations and additional information will be given in supplementary pages, as occasion may require, for which see ADDENDA.

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SAILING DIRECTIONS

FOR THE

COASTS OF SPAIN AND PORTUGAL.

NOTE.—*The Soundings are those taken at low water, spring-tides; and the Bearings throughout are magnetic, except where otherwise expressed.*

An order, issued by the Lords Commissioners of the Admiralty, states, that in order to prevent mistakes, which had frequently occurred from the similarity of the words STARBOARD *and* LARBOARD,—*in future, the word PORT is to be substituted for* LARBOARD *in all H.M. ships or vessels.*

THE COAST OF SPAIN.

FROM CAPE ORTEGAL TO RIO MINHO.

WINDS IN THE BAY OF BISCAY.—In the Bay of Biscay the wind is most variable; but it has been observed, that in the winter months it varies from S.W. to N.W. by W., the last being the most frequent. From May to September, sometimes also in December and January, winds from E.N.E., East, and E.S.E. are found. During the two last-mentioned months, these winds are fresh and lasting; those from N.E. freshening up with rain, and if there is a gale of wind it will come from east or S.E. and may be expected to be severe.

Gusts of wind from S.W. to N.W.—In the English Channel or Bay of Biscay, when the wind comes in from S.W., whether in summer or winter, if it be attended by rain, increases in quantity, and the squalls become heavier and more frequent from this part, with a slight tending to vary, a change of wind may be expected. Generally the wind is from S.W. to west rapidly, and sometimes to N.W. in a squall, and blowing harder than before. This state of affairs may become of serious consequence to ships working to windward and on the port tack, and even to those running free or with the wind abaft, if unprepared, and sail be not reduced in time.

Sometimes the change from S.W. to N.W. is preceded by a short calm, which must never be trusted. It has also been observed in the Bay of Biscay, that when a breeze springs up from a point opposite to the sun, it does not last, and indicates merely a slight derangement of the atmosphere.

Winds from north and south are not very frequent; they prevail now and then, but not to a great extent, nor for a long interval, although they sometimes freshen up into strong breezes and even gales. Those from south will draw to S.E. or S.W.; and those from north will become N.E. or N.W.

On the Coast of Portugal, and in general from Cape Finisterre to Cape St. Vincent, during 10 months of the year northerly winds are found, varying from N.E. to N.N.W. They blow fresh with fine weather, especially during summer. If there should be a gale during winter, it comes most frequently from south to S.W., sometimes from W.S.W., and blows very hard.

From Cape St. Vincent to the Canary Isles, the prevailing winds are from N.E. to N.W.

CAPE ORTEGAL lies in latitude 43° 45′ 12″ north, and longitude 7° 56′ west from Greenwich. Off the point is a *shoal*, lying from it N. by E., ½ a mile; and over the point is high land, upon the summit of which is built a watch-tower, affording a good mark to vessels making the land hereabout.

CEDEIRA.—Steering W. ¼ S. from Cape Ortegal, 7¼ miles, you will see Point Candelaria. The shore all the way is rocky, and should not be approached too near. Over this point is also a watch-tower, built on an eminence, and serving for a good landmark. From hence the shore trends away S.W. by S., still rocky, and having a *shoal*, with only 3 fathoms water, near the land. Passing this, and at about 2½ miles from Point Candelaria, you open the harbour of Cedeira, of small dimensions and shallow water; but the entrance is very easy, and the ground holds well. Going in, you should give the starboard land (Point Pantin) a berth, clearing the *Mexiones Rocks*, and keeping about 1½ cable's length from the shore, until you have passed the *White Rocks;* then run alongside Serreidal Point till you are opposite Solveiras; stand on toward the centre of the harbour, until the flagstaff of the castle comes in a line with Point Pantin. Moor north and south, in 2½ or 3 fathoms water, sandy ground. But it should be remembered, this harbour is open to, and much incommoded by, winds from the north-westward.

The course from Point Candelaria to Cape Prior is nearly W. by S. ¼ S., and the distance 14 miles; several small bays or roadsteads are within the space, but none worthy of description, forming no refuge for ships of any burthen. And the only remarkable object is Mount Campelo, which stands to the south-westward of Point Frouseiras, having a watch-tower on its summit, and appearing with a sharp-peaked top.

Cape Prior next presents its broad head to the observer, and may be well known by a low sandy beach to the eastward, and another to the southward; these appear to join each other, making the cape look like an island. On the eastern side of Cape Prior are several *sunken rocks*. It may here be proper to remark, that there are several *rocks* between Cape Ortegal and Cape Prior, over which the sea breaks with a swell; for the current sets in towards the land, and with light winds it will require great vigilance to prevent being embayed, or driven on shore; but large ships, with a good steady breeze, may pass safely on, even within 2 miles of Cape Ortegal.

All along this coast the tide rises about 15 feet; and it is high water about 3 o'clock on full and change days; but with the wind from the N.W. the rise is generally greatest.

On Cape Prior is a lighthouse, elevated 454 feet above the level of the sea, and visible about 15 miles, according to the state of the atmosphere.

Proceeding from Cape Prior to Cape Priorino, the course is nearly S.S.W., and the distance about 2 leagues. In the way lie *two rocks*, called *Gabieras*, high, steep, and separated from the main land, but having, it is said, a passage for boats between. Cape Priorino is not so lofty as Cape Prior, having no danger, except a *shoal* to the southward, and that is close to the land. Behind the Cape is Mount Ventoso, having a signal-house on its summit. S. by E. ¾ E. from Cape Priorino, ½ a mile, is

Little Priorino, forming a broad appearance, and considered a good for mark distinguishing the entrance to Ferrol.

On Cape Priorino is a lighthouse, exhibiting a *fixed* light, varied by a *flash* every two minutes, elevated 94 feet, and visible 11 miles.

FERROL is an important sea-port, situated at the influx of the River Juvia. The present town is of recent erection; but there are established dockyards, arsenals, and considerable manufactories. The harbour, for depth, capacity, and safety, is considered most excellent; but it is not with every wind that vessels can get out to seaward. Its position is remarkably secure; for in approaching it, the channel is guarded by many fortifications, and the landing well protected. It has a basin, where vessels are laid up, of great extent and solid workmanship. The Marine Barracks is a noble building, and capable of accommodating 6000 men; there are also all sorts of naval establishments. But it is not in times of peace a place of any great commerce, the principal manufactures being sail-cloths, ropes, hardware, and leather.

A *dangerous rock* in the entrance of Port Ferrol, in the way of vessels beating into or out of the harbour, has been recently discovered. It is named the Cabalino, and the following compass-bearings give its positions:—

The S.E. angle of S. Felipe Castle, N. 71° E.

The S. angle of S. Carlos Castle, N. 14° W.

The N.W. angle of St. Martin Castle, N. 85° E., and its distance from the south shore of the channel is not more than half a cable's length. It is nearly circular in form, about 7 feet in diameter, and at low water its summit is awash, though concealed by the seaweed; the depth round it is 9 feet close-to, and increases to 18 feet. S.E. by S. from the Cabalino, distant 74 yards, is the Cabalo, consisting of three connected masses of *rock*, the highest and north-westernmost of which is of a tabular form, nearly round, and connected with the Cabalino by a reef. The Cabalo rises 8 feet above the sea, and is nearly 24 across, N.W. to S.E.

To the south-eastward of Cape Priorino are the battery, watch-tower, and Point of Segano, the latter being high and steep; near its extreme point is a *rock*, called *La Muela*, covered with weeds: this calls for the utmost attention; therefore, observe that on making for this harbour, when you bring Bispon Point on with the N.W. angle of the barracks (which is a remarkable square building, seen on a commanding situation, along the course of the channel), and the western point of Segano in one with the western point of Coitelada, you will be on the *Muela Rock*, over which are only 6 feet water; get the points of Coitelada and Segano in one, and bring the slope of St. Christopher's Hill, (which lies near St. Philip's Castle,) on with the Point of Bispon, and you will go to the northward of the rock, in 5 and 6 fathoms water; bring the slope of the same hill on with the S.W. corner of Batallones Barracks, and you will clear the rock, in 7½ fathoms. Between La Muela and Point Segano is a passage with 4 fathoms water, rocky ground; to be used by small vessels only, in cases of emergency.

Ferrol Harbour is enclosed by hills on every side; there is no difficulty in sailing into it; only keep in the middle of the channel, and all is clear. The best winds are from the S.W. round by the west to north; any of these will carry you to the southward of Cape Priorino, which you should pass at the distance of ½ a mile. If the wind blows from the S.W., you may sail in nearer to the south shore; if from the north, tack towards the north shore, avoiding the *ledges* which run from St. Philip's and Palma Castles.

From the neighbouring Redonda Point a *small reef* also projects, and off Bispon Point lies a *rock*; therefore give the land a proper berth, and anchor where you choose, observing only that it is usual to moor N.E. and S.W.; so that with the wind at S.W., you first let go the anchor on the port bow, or the contrary, according to circumstances. Such, however, judgment will dictate, and must be dependent on

the tide, and place you are going to anchor in. There is *rocky ground*, with 5 fathoms on it, about the length of a boat, lying directly in the fairway, between the Mole of Ferrol and Point Seixo, which is very apt to damage rope cables; to avoid this, bring the point of Bispon in one with a road leading from St. Christopher's Hill, to St. Philip's Bay, or the east point of the entrance to the arsenal a little covered by the windmill; and let the flagstaff of the Artillery Park be in one with the Convent of St. Francis.

With equinoctial gales the tides run in strong; at which times it is always advisable to go into or come out of, the harbour one hour before either high or low water, that you may head the current; this is more requisite when many ships are passing, but otherwise you may wait until the return of the tide. In these gales the tides rise nearly 15 feet, being nearly 2 feet more than they do at ordinary spring-tides.

With the wind unfavourable, you may gain the Bay of Carino, where you will find from 8 to 12 fathoms water, sheltered from the N.W., north and N.E.; but be careful to keep the harbour open, that, on the first symptom of a south-westerly wind, you may be able to run in, for these winds are most dangerous.

Should the winds not only be adverse, but too powerful to allow you to run into the bay, the best method you can adopt will be to run for Coruña, or the Groyne, where you may wait in safety until the weather becomes more favorable.

Rather more than $1\frac{1}{2}$ mile S.S.E. $\frac{3}{4}$ E. from Cape Priorino lies Cape Coitelada, being the south point of the entrance to Ferrol, and the north point of the entrance to the Bays of Ares and Betanzos. Nearly S.W. of this, distant $2\frac{1}{4}$ miles, lies the island of Marola, high and steep, marking the boundary of these two places; Ares running in nearly E.S.E., and Betanzos S.S.E. The coast in entering from Coitelada, is high and steep as far as the *Miranda Rock*. To the eastward is the castle of Ares; a mile E.S.E. of which is a *rock*, called *Camoco*.

The BAY of ARES is about $\frac{1}{4}$ a mile in depth, and the town is situated on its western bank. About $\frac{3}{4}$ of a mile from Comoco is the Redes Castle; the shore winding again to the northward, in which stands the town of Redes; further on is the bridge of Hume. This land now turns S.S.W. towards Betanzos Bay, and is all high and steep, with *loose rocks* under it.

The appearance of the openings of Ares and Betanzos seems to promise good harbours and places of safety; but they are extremely dangerous, lying open to both winds and seas; therefore none but small coasters venture within them, anchoring to the eastward of Fonta Castle, in 3, 4, or 5 fathoms, sandy ground, or to the *eastward of Ares*, in $4\frac{1}{2}$ fathoms, sandy ground; to this latter anchorage south winds are particularly dangerous, and small vessels should rather run into the Bay of Redes, where the shelter is better, and the bottom soft, with a depth of $2\frac{1}{2}$ fathoms.

But should a large vessel be driven into these bays, let her bring-to in the best situation circumstances will admit of, remembering that a *rocky shoal*, with only a fathom over it, lies on the northern side, near Miranda Rock, and that when Point Diexo comes in one with the tower of Hercules, at Coruña, you will be upon it. The channel between it and the shore is always rough, and generally breaks, although there are 7 and 8 fathoms water within it.

CORUNA.—This is a considerable sea-port; the town is situated on a peninsula, and divided into the upper and lower towns: the former lies on the declivity of a hill, being surrounded with a wall, and defended by a citadel. The lower town is situated on a small tongue of land; here are an arsenal and an ancient tower of remarkable height and solidity. The harbour is spacious and secure, being in the form of a crescent, and provided with a handsome quay. The entrance is protected by the castles of Santa Crux and St. Diego, and also by the fortresses of Dormideras and St. Antonio; this latter being built upon an insular rock, commands the port. Although this place does not carry on much trade, it is yet considered as the capital of Galicia and has a Governor General and Intendent of the Province residing in it.

Nearly S.W. by W. from Cape Priorino, distant 5½ miles, stands the tower of Hercules, a lofty building, now converted into a lighthouse, which is in latitude 43° 23′ 36″ north, and longitude 8° 23′ 30″ west. It is a very ancient and singular structure, of three sides only, but surmounted by a modern lantern, and shows a light which *revolves* every 3 minutes, and is elevated 336 feet. A faint fixed light will be seen within 12 miles, but the lustres will be visible 20 miles, but beyond 12 miles for some 7 seconds only.

In making for the harbours of Ferrol or Coruña, be careful to keep off the land at night, for the currents may drift you into danger; or unless you can do better, remain in the neighbourhood till morning; or to the westward of the Sisargas Islands, standing off and on, as occasion may require. Should the wind be from the S.W., you will find a current setting strongly towards Cape Ortegal. Be careful to provide against being driven to leeward of the harbour of Ferrol; for with a large ship the Bay of Veras, or Barquero, is the only port on this part of the coast that can be taken with safety; the entrance to this bay lies 10 miles east of Cape Ortegal.

When blowing from the N.E. you may run within 2 miles of Cape Prior, and thence steer for Cape Priorino; then if the gale be not too hard, you may run for Coruña. Some dependence may also be placed on your soundings, for from the regularity of them, and the noise of the sea dashing against the shore, you may, in thick and dark weather, calculate your distance from the land.

If you should reach Coruña with good weather, and a fair wind from the N.E. or N.W. quarters, you may steer towards the Point Seixo Blanco and Mount Mera, until you observe the Castle of St. Diego come open to the eastward of that of St. Antonio; you will then be clear of the *Basurel Reef* and *Bank;* steer on for Diego, pass Antonio, and when between these castles, choose your anchorage.

If your ship be large, and of great burthen, bring St. Antonio N.E. by E., and anchor in 6 or 7 fathoms, oaze and mud. A smaller vessel may stand further in, having St. Antonio E.N.E. or E. by N., or even more advanced, always taking care not to anchor in those parts encumbered with the sea-weed; for with heavy gales the anchors will not hold. With violent winds from the N.N.E. and N.N.W., your best entrance will be under the lighthouse, between the *Basurel Bank* (described hereafter) and the land; run along the north-east side of the tower, at such a distance as that you can see its foundation; keep near the point Rebaleyra and the *Ox Rocks*, for the point is clear from danger, and you may safely pass it at the distance of 2 cables; steer S.E. until you observe St. Diego's Castle on with St. Antonio; then proceed as before directed.

But if you are desirous of running between the point of Seixo Blanco and the above bank, which, however, is not so good as the western channel, you must stand toward the mouth of Ferrol Harbour, until you are S.S.W. of Cape Priorino; then bring Point Segano in one with St. Christopher's Chapel, and steer to the south-westward until the castles of St. Diego and Antonio are in sight; stand on thus until Seixo Blanco bears E.S.E., by which time you will have cleared all the banks, and may thence steer southward, until the battery of Mera bears E.N.E. Be careful in attending to the directions given.

On Pedrido Point is a battery, and off it runs a *small reef* to the eastward. The castle of St. Antonio stands on a rock separated from the land, with some *shoals* extending 60 fathoms from its southern side: between the point and castle are the *Rocks* and *Shoals* of *Pedrido*, part of which are to be seen at low water, though the whole are covered at high tide. To the eastward of this reef lies a *most dangerous shoal*, with only 3 fathoms over it; you should, therefore, be careful not to go nearer to the Pedrido Rocks than 2½ or 3 cables' length; but so soon as they bear W.N.W. and N.N.W., you may run safely within a stone's throw of them.

About a cable's length north of St. Diego's Castle is a *small shoal*, with only a fathom over it; and N. by W. from the same castle, and S.W from St. Antonio's Castle, is another *rock*, covered with only 3 fathoms. From the former castle towards

the interior of the harbour, the whole shore is encumbered with *shoals;* the best anchorages therefore, are from the middle of the harbour to the S.W. shore.

Between Santa Cruz and Mount Mera is a large bay, with good anchorage, the mount bearing N.W.; but it is a bad situation with N. and N.W. winds, on account of the heavy sea brought in by them; care must also be taken of the *shoal of La Tonin*, which, although there are 10 and 11 fathoms over it, always breaks with heavy gales. The marks for this shoal are the N.W. point of Canaval Island in one with Great Priorino Cape, and the Porteli Rock on with the Mosori Chapel.

N.W. $\frac{3}{4}$ W. from Seixo Blanco Point, and E.N.E. $\frac{1}{2}$ E. from the tower of Hercules, lies the centre of the *Basurel* and *Jacentes Banks*, extending E.N.E. and W.S.W., about a mile, with from $5\frac{1}{2}$ to 17 fathoms over them, where the sea breaks with a heavy swell from the N. and N.W. Seixo Blanco Point on with the N.E. end of some old walls standing on the top of a hill adjacent, bearing S.E. by E.; and the Cota Rock, which stands on the top of a mountain, in one with the Nota Rock, on the north side of the tower of Hercules, bearing W. by S., are the marks for the Jacentes, in 8 fathoms, rocky ground. For the *Cabanas Bank*, bring the Dormideras Fort open to the northward of Hercules Tower, or the steeple of St. Francisco on Carboeiro Hill, and you will then be on the S.W. end of the shoal.

These are all the dangers in this harbour; and were it of greater depth and extent of anchorage, it would be a most excellent place for the largest ships; but its shallowness will not allow many large vessels to lie there at one time, because the greater part of them must inevitably be exposed to the north and N.W. winds. Smaller ones will, however, find it convenient and safe.

W.N.W. $\frac{1}{2}$ W., 6 leagues from Coruña lighthouse, is Cape St. Adrian, off which lies Sisargas Island; this bears from Cape Prior nearly west, and from Cape Ortegal W. $\frac{3}{4}$ S., distant 47 miles. The shore between these capes bends in to the southward, and has the mountain of Penaboa about $1\frac{1}{2}$ mile from Hercules Tower, between which is Orsan Bay, fit only for fishing craft. At 3 miles further is Langosteira Point, with a sandy beach on each side; and 5 miles further is Cayon, another small harbour. Langosteira Point bears W. by S. from Mount San Pedro, distant $2\frac{3}{4}$ miles; and upon that bearing, at nearly one mile from the latter, is the *Ferbedoira Rock*, about half a mile from the shore. The *Pego Rocks*, a small patch, having $2\frac{1}{4}$ fathoms on them, lie 3 miles eastward of Cayon Point, and $1\frac{1}{4}$ mile from the land; and the *Curbina Rock* lies a mile N.W. by W. from Cayon Tower. The low flat shore of Baldayo then runs a considerable way, having Mount Nemio to the south-westward. About $4\frac{1}{2}$ miles westward from Cayon is a *rocky bank*, called the *Baldayo Bank;* at low water seven of the rocks are visible, but at high water only the middle one is to be seen. This bank lies in a north and south direction, about $1\frac{1}{2}$ mile in length, and more than a half a mile from east to west, and must be considered *exceedingly dangerous*. Between these rocks and the land is a passage, so that vessels may run through, if necessary, in safety, there being 14 and 15 fathoms within it. It has been asserted that a *shoal* lies about this part, with only 5 fathoms over it, although close to it are 40 fathoms, and that by keeping the tower of Hercules open of the land, you will always avoid it. We do not believe any such shoal exists, but mention it merely on the authority of the Spanish pilots; there can, however, be no harm in steering so as to shun it.

Proceeding towards Cape St. Adrian, you pass the small harbour of Malpica, fit only for small craft. Here rises up Mount Adrian, the foot of which extends to Cape St. Adrian. From off this cape, several *islands*, *rocks*, and *shoals* extend $1\frac{1}{2}$ mile to the northward, one of these being called, as before mentioned, Sisargas Island; between these are several channels, with from 6 to 10 fathoms water, but the ground is wholly rocky and bad. A vessel may, if urged by necessity to do so, pass between these rocks and Cape St. Adrian with W. or N.W. winds; or, if coming from the eastward, with E. or S.E. winds. The current with the flood is strong, and sets to the eastward.

On the largest of the Sisargas Islands a lighthouse is erected, elevated 363 feet, and

exhibiting a bright light, varied by *red* flashes every four minutes, and visible in clear weather about 11 miles.

At 3½ miles from hence is Point Nerija, of moderate height, and having many *rocks* running from it; behind which, to the eastward, is the harbour of Avarizo, frequented by coasting vessels; in entering, you should keep towards the western shore, which is clean, but far up the water becomes shallow. From Point Nerija the shore bends inward, then runs out to Point Roncudo, round which point are several *rocks* and *shoals*, which, by giving a berth to, may be easily avoided. Point Roncudo is the northern point of the bays of Corme and Lage, on the N.N.W. and west shores of which the water is deep enough for most vessels, but the bottom is rocky. W. by N. from Roncudo Point lies a *sunken rock*, with not more than 3 fathoms over it, at low water. Several rivers with excellent water fall into the Bays of Corme and Lage, with which article a whole squadron may readily be supplied. Point Lage may be called the S.W. point of these bays; it is distant from Point Roncudo about 2⅛ miles; and from hence the coast bends to the south-westward, ending at Cape Villano, being high, rugged, and rocky all the way. At 8 miles from Lage is Baleas de Tosta Rocks and Cape Trece, very low, and encircled with *rocks*: although behind the point several high mountains rise up, with rugged and peaked tops. Near Cape Villano there is a very remarkable one, of red appearance, pointed at top, and resembling a high tower; also 1½ mile to the eastward is a large patch of sandy-coloured earth: by these appearances the cape may always be known from any other part of the coast. N.N.W. from the cape, about ½ a mile, is the *Bufardo Shoal*, small, but peaked at top, the sea breaking over it, though all around is deep water.

CAMARINAS.—Cape Villano (in latitude 43° 10′ north, and longitude 9° 12′ 15″ west) is encumbered with many *rocks* and *shoals*, and forms the northern point, or entrance to the harbour of Camarinas. A mile to the southward is Cuerno Point, having many *shoals* about it, mostly visible; but close to their western side the water is deep enough for any vessel. At 2 miles further is a hill, on which stands a hermitage, and ¾ of a mile from that is the Point of Castello Viejo, low and clean, with an old castle upon it; not far from that is a fortress, erected for the defence of the harbour. To the northward is the town of Camarinas, having a pier running from it, which dries at low water. E.N.E. is a small cove, and to the eastward a river.

Camarinas Light is on Cape Villano. This is a *fixed-light*, elevated 228 feet and visible 10 miles. First lighted in 1854.

About a mile from the fort is the Point of Merijo, high and steep, with a castle in ruins upon it, and a small town near it; between the river and this point the shores are clean, and in some parts steep. Further on is Chorente Point, high, broad, and steep; to the north of which lies a *small shoal*, with only 7½ feet water. The town of Mugia has a clean beach before it, only there are some *large rocks* near the shore; to the southward is a ragged hill, running down toward Point Cruces, on which stands the Chapel of N.S. de la Barca; this is the southern part of the bay of Camarinas. It is encircled with breakers close to its point; but a little way off you will find 10 and 12 fathoms water, rocky bottom. Opposite the mouth of the harbour lie *two rocky shoals*, named the *Quebrantas*. The Great Quebranta has from 3 to 7½ fathoms over it, except at its northern end, where, at low water, it appears above the surface, in shape like a buoy. The Rock bears W.S.W., 1¼ mile from Cape Villano: the marks for it are, the old castle in one with Lagos, and Buitra Point on with the little hill of Fuente de las Yeguas. The Little Quebranta is, we believe, a part of the same shoal, breaking all over, though there are 5 fathoms over it. Its marks are, the old castle's point in one with the white rocks on a hill, at the S.E. end of the bay, at the extremity of which lies the point of Lagos; and Buitra Point on with the end of the high land of Cape Torinana. There is also another *shoal* about ½ a league to the westward of the Quebrantas, over which, with gales from the westward, the water breaks; but not less than 5½ fathoms have been found upon it.

Vessels entering Camarinas Bay with E.S.E., or E.N.E. winds, should round Cape Villano, avoiding the *Bufardo Shoal*. There is a passage on either side; and when the

cape bears E.N.E., run on for N.S. de la Barca: you will then pass near the breakers off Point Cuerno. Having cleared these, steer for the Point of N.S. de la Monte, and when within 2 cables' length of it, haul up for the Point of Castillio Viejo; when this point comes W.N.W. turn in, running not nearer than 2 cables' length toward the new castle, or Fortress Point; then make for the eastern shore, get abreast of the town of Camarinas, and anchor ½ mile off, in 6 fathoms, mud, mooring east and west. In southerly gales there is a muddy creek to leeward, where vessels often run ashore with safety.

Should an easterly wind be too strong, then you must bring the point of the old castle W.N.W., and anchor, or run into Merijo, the ground there holding well, with from 4 to 7 fathoms. N.W. winds drive in a heavy sea, otherwise you will ride well; but be in readiness to sail for the north part of the bay, should occasion require.

Should you make for Camarinas Bay with the wind from the S.W. or N.W., do not go near Cape Villano, but get about W.N.W. from N.S. de la Monte; sail in mid-channel between the Quebrantas and Cruces Point, attending to the directions already given. Fresh water may be had in plenty at Camarinas Town.

W. ¼ S. from Point de la Barca, distant 1½ mile, is Buitra Point, high and steep; and W.S.W. from Buitra, 2½ miles, is Cape Torinana, the shore being bold. The cape is low and rugged; but it is not a distinct object when coming from sea, to indicate where you are. Near Buitra Point are *two large rocks* above water; and off Cape Torinana is a *small sunken rock*, over which the sea breaks: there is a passage between the cape and rock, by letting the Hermitage of N.S. de la Monte be covered by Buitra Point; but running on its outside, and near it, observe to bring a hill, lying between Camarinas Town and the above hermitage, by the side of Buitra Point; from hence your course to Cape de la Navé will be nearly S.S.W., distance 3 leagues.

H. M. steam-vessel Africa, on her passage from Lisbon, 26th of May, 1833, struck upon a *sunken-rock*, Cape Torinana bearing E.S.E., distant a mile, and Cape Finisterre S. by W.; and in October following, H.M. steamer *Confiance*, observed *breakers* near the same spot.

To the westward of Cape Torinana lies a small island, high and round, with two points, and encompassed with *shoals*; the coast hence trends to the southward, where at 5 miles from the cape it forms a bay, in which vessels may anchor in 6 or 8 fathoms, sandy bottom, going not too near the northern side, for there the ground is foul: here you may lie sheltered from E. and N.E. winds. About 7 miles farther is the Point of Cape Finisterre, a remarkable and well-known headland, lying in latitude 42° 53′ north, and longitude 9° 15′ west from Greenwich. The Navé is formed by a hill of that name, flat on the top, and having at its base a little island; and 1½ mile N.W. ½ W. from the Navé lies the *Munis Rock*, with 3 fathoms over it.

Cape Finisterre Light.—The light established at this Cape is on the revolving principle, and will appear every half minute, it is elevated 474 feet above high water, and visible 24 miles in clear weather.

CAPE FINISTERRE is neither so high nor so flat as the Navé; it is steep, uneven, and the landing inconvenient.* Between the cape and the Navé is a kind of roadstead, where the land is low; by this the cape may be readily recognised, for there are no appearances like it on this part of the coast. Another mark to know this place by is, that from the cape the shores run to the east and to the north, and the Lezara Mountain appears to the E.S.-eastward, broken at the top, and not unlike the teeth of a saw.

N.N.W. of the Point of Cape Finisterre lies the little Island Centolo, about which the water is deep; and those acquainted with this part of the coast frequently sail between it and the land. The ground is said to be clean, though some *small shoals*

* A *rock* is stated to lie about 3 miles off Cape Finisterre, even with the water's edge, but of which we have no particulars, and consider it very doubtful.

stretch off from the west side of the island. At a little distance S.S.W. of the point of the cape is a *rock* under water, named *Turdeiro*, with about 2 fathoms flowing over it. There is also a *shoal* lying about N.N.W. ½ W., distant 1¼ mile from Centolo Island, called the *Carraca*, with 2 fathoms upon it. From the cape the land runs in N.E., and about 1½ mile within it stands the town, with a pier annexed to it, chiefly for the use of fishermen, and a battery adjoining. The low land of Costeiro here begins, continuing to Sardineiro, which is both high and steep. Within this space to the north-eastward of Cape Finisterre, are several small roadsteads, where vessels frequently find shelter from north-easterly winds; but be upon your guard, lest you should be surprised with gales from the south, for these blow directly upon the shore, and render it very dangerous. This is also the case with the anchorage before Costeiro and Sardineiro.

THE RIVER and BAY of CORCUBION runs in northerly 2 miles; the shores being high and clean. The place for anchorage is between the two forts, in 10 or 11 fathoms. To enter this harbour, with winds from the S.E. and S.W., steer for Great Lobeira; the ground is clean, and the water around it is deep. When abreast of Great Lobeira, stand on between Little and Old Corromeiro Rock, where the channel is a mile broad: between the rocks and the land, to the eastward, it is a mile in breadth, and clear of danger, with 17 fathoms water. Keep in the middle of the passage, or pass nearer the island than the shore; for a *small shoal*, called the *Asno*, lies there, the marks for which are, the N.N.W. part of Old Corromeiro in one with the S.E. part of the Great Lobeira, and Point Galera on with the low shore of Fornelo. There is also *another shoal* running to the westward from Los Bueyes de Jures, or the Oxen, which are situated between the Asno and Point Galera, distant from the latter about ½ a mile, and from the former rather more than $\frac{1}{10}$ of a mile. The *Oxen* are *three rocks* above water, lying triangularly, and appearing similar to three boats, with deep water round them, except to the westward, as mentioned before. Vessels may pass between these rocks and the eastern shore, or between them and the Asno Point or Galera; the last channel is narrow, but with from 9 to 13 fathoms water. Let your best anchor be to the southward.

Sailing in with the wind at N.W., the fairest passage will be between Cape Cé and the Little Corromeiro: there are 6 fathoms in mid-channel: keep near the Corromeiro, and on rounding it, haul up for the bay as close as you can; but if the wind should prevent you going in, anchor, take advantage of the tide, and get into a proper berth when convenient.

With the wind from the N.E., a good sailing vessel should tack about the mouth of the bay, and there anchor; but if prevented doing this, run for the anchorage at Costeira, or abreast of Cravia, and wait for a more favourable wind.

The Bay of Corcubion is formed by the points of Galera and Cé, distant from each other about a mile. Cape Cé is lofty, and has a *shoal*, with shallow water, stretching out 3 cables' length from it; but Point Galera is low, and surrounded by *several rocks*, having deep water close to them. From these points the Bay of Corcubion runs in northerly about 2 miles; the shores are generally high and clear from danger; some little coves are to be found within it, two of which are situated near the extremity of the bay. On the port side is the town of Corcubion. On the starboard is the Fernelo River; and further on the town of Cé. Sailing in this bay you will perceive two castles or forts, on two points of land, nearly opposite to each other; that to the eastward is named Prince's Fort; that to the westward, Cardinal's Fort; the distance across the bay being nearly $\frac{7}{10}$ of a mile. We have already said the place for anchorage is between these forts, in 10 and 11 fathoms, gradually decreasing towards each shore. The bay is good for all vessels; and if you are desirous of going far up, you may stand on for the low beach of Fernelo, into 7 and 8 fathoms; but this is hazardous in winter, for should the wind chop round to the southward you will have to encounter a heavy sea, driving you into shallow water, or to the extremity of the bay, where you cannot conveniently let go an anchor, should she drag or part from those out.

There is a small bay situate under a mountain of the same name called Lezara, with good bottom and deep water; into this bay runs a small river where vessels may water; there is also a small cove near Pindo; south of which is the beach and anchorage of Cravia, before mentioned. S. ¼ E., at the distance of 4½ miles from Cape Cé, is Caldebarcos, from which a *ledge* runs out ⅛ a mile to the southward, and having foul ground near the land, and towards Little Lobeira. Westward of Caldebarcos, about 3 miles, is *Duyo*, a *small shoal*, with 2¾ fathoms over it.

You will now approach Point Remedios, lying nearly S.S.E. from the Point of Cape Finisterre, distant 7¼ miles; adjacent is a little conical hill, ¼ of a mile east of which is another, somewhat larger. To the northward of Point Remedios, at the distance of 1¾ mile, lie the Arrosas-y-Arrosinas Rocks, and to the westward the large clusters of *rocky islands* called the *Mizarxos*, encircled with *shoals;* within which and the point, coasters frequently pass. From hence the coast runs S. by E. ½ E., 3 miles, to Point Lens, all rocky land, ending at the point with a *reef* and *two sunken rocks;* avoid these; and 2 miles further is Mount Louro, or Loire, high, round, and separated into two points or peaks, which at a distance appear like an island; on the southern and highest peak is a watch-tower; this point is easily known, and forms the north point of the Bay of Muros de Noya.

N.W. ½ W., 5½ miles from Mount Louro, are the *Meixido Shoal* and *Ynsua Rocks*, very dangerous; but the water constantly breaking over the shoal, renders its situation distinct and visible; there is a good passage between it and the shore, a league wide, but if running on the outer side of the shoal, bring the Navé of Cape Finisterre open of the cape; you will then be close to the westward of the shoals; this is the safest passage.

Nearly 3 miles W.N.W. from Mount Louro is a *cluster of rocks*, called the *Bruyos*, so low that the sea frequently dashes over them. Between these and Point Lens is a good passage, though outside is to be preferred. Mount Louro has some *rocks* off its point, called the *Leixones*. Between them and the shore is said to be a narrow channel, but too dangerous to be attempted without a pilot.

The BAY of MUROS may readily be known by the appearance of Mount Louro; but if this hill should not be visible, you will, to the northward, perceive Cape Finisterre, or Mount Lezara; or, to the southward of the bay, the Peak of Curota, the highest of any at this part.

To enter this bay with a northerly wind run under Mount Louro, leave the *Leixones Rocks* on your port side, give a berth to Point Bouja, and steer round the southern point of the port of Muros; then, if prevented going right on for the harbour, tack, get opposite the town, and anchor in 7, 8, 9, or 10 fathoms, mud and oaze, mooring north and south.

If coming in with winds from south to S.E., run along by the *Shoal of Baya*, which lies opposite Point Castro, but avoid bringing Misericordia Chapel, which stands on Point Atalaya, in one with Point Cabeiro; then, having passed the shoal, anchor where you please, coming not too near the shores; you will have 10, 11, and 12 fathoms soft muddy ground; in the middle of the bay are 19 to 23 fathoms.

The bay is for the most part surrounded with high lands. If bound to Noya, it is requisite that you should have a pilot, there being several *shallow spots* to avoid.

The southern point of Port Muros is high, and perpendicular over the water, having a windmill over it; the harbour of Muros runs in N.N.W. and N.W. by N., more than a mile; you will here see a castle, where the flat beach begins, which runs to the little town of Muros; further on is another small town, called St. John de Sierras. The northern point of the harbour is of moderate elevation, and at high water becomes an island, its western side being shallow, and its eastern side deep; on it stands the Chapel of St. Antonio, from which the coast runs N.N.W., tolerably high, but near the land the water is shallow.

A little further is Point Outeiro Gordo, broad, high, and clean; here begins Bornalle

Bay, extending N.E. about a mile, having a rivulet and sandy beach; a rocky shore then commences, running S. by W., having several small points, and ending at a small rocky island, with a chapel in ruins on its summit. This part requires vigilance; the other parts are clean, and have sufficient water. Between this island and the main is a channel, used only by boats. E.S.E., a little more than a mile, is Point Burneyra; the coast from the small island to this point is all rocky, and must have a berth. Continuing on $\frac{3}{4}$ of a mile, you arrive at Point Uhia, which is rather low and shallow; the land, after you have passed it, becomes high. Point Uhia is the western point of the Bay of Noya; near it is the lofty island of Quibra, lying north and south, the water at each end being shallow; the opening between it and the main is fit only for boats.

At $\frac{3}{4}$ of a mile from Quibra, on the opposite shore, is Point Plancha, appearing high, but not running far out; it is the eastern point of the Bay of Noya, has 4 fathoms water near its point, and mid-channel from 9 to 10 fathoms. The bay opens to the northward; and about 3 miles from the entrance stands the town, which is small, but of ancient establishment, where ship and boat-building is the chief employment of the natives. Small vessels may run in as far as the town; but, as before observed, it is necessary to employ a pilot. From Plancha Point, about a mile, is Point Portosi, low and rocky, with deep water before it; between are some *rocks*, the land forming a kind of bay. At 2 miles further is Point Cabeiro, high, broad, and clean; and between is a sandy beach, about midway, ending in a rocky point. At $\frac{1}{2}$ of a mile from Point Cabeiro is Point Polveira, from which runs a *reef*, N.N.W., about $\frac{1}{2}$ a mile, on which, at low water, appears the *Filgreyro Rock*. The Atalaya de Son lies W.S.W., a mile from Point Cabeiro; it is of a sombre appearance and steep, but of moderate elevation; on it stands the Chapel of Nostra Signora de la Misericordia; here is the town of Son, having a pier for the convenience of small craft. Between Point Polveira and this pier are several small *rocks* and *shoals*. Nearly S.W. by W., distant 2 miles from the Atalaya de Son, is Point Castro, having a rocky bay between, in the middle of which a point runs out, called Liseira; before it are several *rocks*. Point Castro is not very lofty, but projects into the sea, is steep-to, and of a dark colour; from it a *reef* extends to the westward, about the length of 2 cables.

The Baya Bank, lying off Point Castro, is large, and nearly uncovered at low water; between it and the shore is a small passage, with a rock called the Con, lying half-way from the shore; this passage has deep water, and is used by coasters only. To the southward of Point Castro is Point Roncadora: the space between is filled with *rocky islands*, which lie close in to the shore. At 2 miles further is the River Sierra, the coast being bold all the way; and from hence, about 2 leagues, is the Cape Corrobedo, bearing S.S.W. $\frac{1}{4}$ W. from Mount Louro, distant $9\frac{1}{2}$ miles, and south from Cape Finisterre, distant $6\frac{1}{2}$ leagues.

W. by N. from the River Sierra lie the *Basonas*, distant $2\frac{1}{2}$ miles; the largest of these rocks appears like the hull of a vessel, but the major part of them are under water; close to them are 14 fathoms, increasing eastwardly to 20 and 21 fathoms, and between them and the Baya Bank are 23 fathoms. The shore continues rocky and low in some places, until you approach Point Caresinas, which is of moderate height, terminating in a point, called the Great Tombo; a lesser hill stands by it, called the Little Tombo. Neither Caresinas or Espineiria Points should be approached within $\frac{3}{4}$ of a mile, in order to avoid the rocks which lie off them.

CAPE CORROBEDO.—On Cape Corrobedo is a fixed light, elevated 106 feet above the level of the sea, and visible, in clear weather, at the distance of 12 miles. S.W. of Cape Corrobedo lie *several shoals*, some of which are stated to be at the distance of $2\frac{1}{2}$ miles. In good fair weather vessels may pass within these *shoals*; but in storms the sea breaks over them very much. In the channel, betwen them and the land, are 12 and 14 fathoms water. S.S.W., nearly 4 miles from the cape, and W. by N., $1\frac{3}{4}$ mile from Falcoeiro Point, are the *Preceiras* or *Pragueira Rocks*, three in number, and lying close to each other, with breakers all round. Nearly 4 miles from Cape Corrobedo is the point of Falcoeiro, between

which is a deep bay with anchorage in 11 fathoms; several *islands* and *rocks* lie off here, resembling, when at a distance, a fleet of ships. One of the southern islands is called Salbora; it is of a reddish cast, high in the middle, and low at both ends. A *chain of rocks* nearly joins it and the shore. This island lies at the entrance of Arosa Bay. Ships from the northward, bound to Arosa, should keep 4 miles from the land, until Salbora bears S.E., when they may safely steer towards it.

SALBORA ISLAND.—A lighthouse has been established on the southern point of Salbora Island; the light is elevated 83 feet above the level of the sea, and is fixed, but varied by *red flashes* every two minutes; and may be seen at the distance of about 10 miles, in clear weather.

AROSA BAY.—Previous to the late surveys, this bay was reported as dangerous to enter, even by coasters; but since, considerable traffic appears to be carried on within it, particularly to Carril, on the N.E. part of the bay, where several cargoes of cattle were recently shipped for England. Several good bays, with excellent anchorage, have been found here, which are easy of access to those who are in possession of a large chart of Arosa Bay.* The principal anchorages are in Sta. Eugenia and Caraminal ó Puebla on the western, and Carril on the eastern side; there is also good shelter for small vessels off the mouth of the River Meluzo, in the northern corner of the bay; about a mile from the entrance of the river they will have 2 fathoms, oazy bottom. Anchorage may be found under the north side of Salbora Island, in 10 to 15 fathoms, by rounding Point Brisan, and bringing it to bear about south, distant ½ a mile. You must not round Point Brisan too close, as some *rocks* lie off it, as shown by the chart.

The entrance between Salbora Island and the eastern shore is full 2 miles wide, when ¾ of a mile eastward of Point Brisan. A course, N.E. ½ E. for 8 miles, will bring you to the entrance of the Bay of Puebla, when you may either haul to the westward, and anchor off the town of Puebla, in 5 or 6 fathoms, or continue on about N.N.E., 2 miles further, and anchor in the same depth off the town of Esteyro, the town bearing E.S.E.; here is sufficient room for any number of large ships.

If bound to Carril, after you have run N.E. ½ E., 7 miles from Salbora, passing between the islands Rua and Pedregosa, you will have Point Cabro, or Ingua, on your port hand, bearing N.W., ¾ of a mile; then steer E. ½ S., 5½ miles, which will bring you into Carril Bay, leaving the Brina, Con, and St. Bartholme Islands, all on your port hand. There is a *rock* in the bay near the town, on which a staff is erected. In this bay are from 2 to 4 fathoms at low water. The town of Villagracia occupies the S.E. side of it.

By an inspection of the chart, it will be seen that the Bay of Arosa has numerous small *islets* and *rocks* scattered about, as well as numerous *reefs* running off from the islands and points, which will, in some measure, account for the former character given to it; nevertheless, the navigable channels that lead to the principal anchorages are sufficiently clear, with the assistance of the chart, to enable mariners having a leading wind and daylight to take them safely through, even without a pilot. Besides these anchorages, good winter anchorage may be found, in 10 fathoms, at the north end of Arosa Island, which lies near the middle of the bay, on the starboard hand going up; in a large ship with a southerly wind this would be preferable to Puebla Bay. You may also anchor on the west side of Arosa Island, in 14 fathoms, about a mile E. by N. from Pedregosa.

AROSA ISLAND.—On Cabalo Point, the N.W. extremity of Arosa Island, is a fixed light; it stands 39 feet above the level of the sea, and may be seen about 7 miles.

At 2 miles E.S.E. from Salbora is Point St. Vincente, the other point of the above inlet, 3½ miles to the southward of which is the island of Ons; between the north end

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* A large chart of Arosa Bay is published by the proprietor of this work.

of this island and the shore of Arre, is a wide channel, but rendered dangerous by a *shoal* called the *Golferas*, or *Travesa*, nearly midway, and a *ledge of rocks* running from Arre, or Corbeiro Point. Vessels therefore pass between the shoal and the island, or the *reef* and *shoal;* of these the former channel is considered the safest; but in stormy weather they are both difficult: the depth is from 6 to 9 fathoms, rocky bottom.

PONTEVEDRA BAY lies to the eastward of Point Cabicastro, which is its northern boundary; from this to Porto Novo Point, is a fine flat shore, opposite which ships commonly anchor, in from 8 to 10 fathoms, sand, and wait there for favourable weather.

The Bay of Pontevedra is not difficult of entrance, but no heavy ship should come into it in winter, as it is so little sheltered. In summer the anchorages are good, except where the bottom is rocky. Should the wind be northerly, you may run through the channel already described, between the Island Ons and Point Arre, or Corbeiro; but if you sail in to the southward of Ons, steer about a $\frac{1}{4}$ of a mile from the little island Onza, which lies at the south end of Ons. About a mile W.S.W. from Onza, is a *rocky shoal*, of $4\frac{1}{2}$ fathoms, over which the sea breaks in rough weather; there are also breakers about $\frac{1}{2}$ a mile S.S.W. from the island. The Bay of Pontevedra may be easily known by the Mountain Curota, the Islands Ons and Onza, the Island Salbora to the northward, and the Cies, or Bayona Islands,* to the southward: all these contribute to prevent the probability of a mistake. Opposite to Cape Cabicastro is Point Udra, the southern boundary of the above bay; its extremity is low, but it rises inland considerably, having a rocky, rugged appearance; and beyond it the land is all mountainous. To run into the bay from between Cape Cabicastro and Point Udra, steer E.S.E. until the island of Tamba appears midway between the two coasts; then steer E. by N. to the south end of that island; southward of which is the anchorage of Pontevedra, in fron 8 to 2 fathoms, muddy bottom, and off the town of Marin.

From Point Udra the coast runs up southward towards the Bay of Aldan, having a stream of excellent water at the town of that name, in the bottom of the bay. You may venture to bring Udra Point as far as N.N.E. The harbour of Aldan is of good depth, with a clean sandy bottom, and capable of accommodating ships of every description; at its entrance are from 15 to 17 fathoms water, decreasing as you advance into it. It is advisable to moor E.N.E. and W.S.W., because the winds from the N.N.W. are dangerous, and bring in a swell of the sea.

To sail into this bay you should have a leading wind, and then keep mid-channel, standing on for Port Con; leaving the Bouteye Shoal to the starboard, run up to the low shore of Arnela, within 2 cables' length of which is the anchorage. Point Couso is the southern point of the harbour of Aldan; it is high and steep, having a *shoal* to the northward. Point Cabicastro is distant from Point Udra $2\frac{3}{4}$ miles, and Point Udra from Point Couso 2 miles. At $3\frac{1}{2}$ miles further to the southward is Cape Hombre, the north point of the entrance to Vigo Bay.

VIGO is easily known by the Bayona Islands before it; but these will appear from sea as part of the main land; in which case you will see the Mountain Curota to the northward, and N.S. del Alva to the southward; beside which no opening will appear in the coast all the way from Cape Silleyro, to the River Minho, the land being high and level throughout. This is considered to be one of the largest, deepest, and best harbours in Spain. The town is surrounded by a wall, and defended by a citadel and castle; it is the general resort of coasting and other trading vessels, and has many barks and fishing-vessels belonging to it.

BAYONA or CIES ISLANDS.—These islands are situated before the entrance to Vigo; and on the centre island, at the top of Mount Faro, which is the foremost point of the southern extremity, a lighthouse is erected, elevated 603 feet above the level

* The newly-established lights on Salbora and the Cies, or Bayona Islands, will now materially aid in pointing out this part of the coast.

of the sea, exhibiting a light varied by eclipses every other minute, visible about 20 miles, or at a lesser distance, according to the state of the atmosphere.

On the *Castle of Na. Sa. de la Guia*, which is situated 1½ mile N.E. of Vigo town, there is a revolving light, of three minutes interval, elevated 104 feet, and visible about 7 miles.

If you are desirous of reaching the town of Vigo by the northern passage, which will be always preferable with a northerly wind, steer under the south shore of Onza Island, within the distance of 3 miles, so as to clear the *Biduido Shoal*, which lies N. ⅓ W., 1½ mile from Point Cabello; stand on east until you bring N. S. del Alva mountain before Point Subrido; and get Mount Ferro quite open of the east point of Point Cabello, which is the north point of the Bayona Island; then stand away in the middle of the channel, giving Points Hombre and Subrido a sufficient berth,* steer next for the Cape de Mar until you get in the middle of the bay; then stand toward the town of Vigo, taking care not to bring the Points of Subrido and Cabello in one until you get sight of Cangas Church; you will, by those means, clear the *Cangas Rocks*. All the points in this bay are rocky; therefore do not get into less water than 8 fathoms: but the ground is every where else clean, with from 14 to 23 fathoms, mud and sand.

To sail into Vigo Bay by the southern passage, you should bring Cape de Mar, known by its sandy colour, in one with the Chapel of Nostra Senora de la Guia, or Mount Poneda, clear of both shores: this should be done before you get in a line between Cape Bicos and Cape Silleyro; you will then be about the middle of the passage, in from 27 to 32 fathoms. Nearly the same depth will continue until you have passed Mount Ferro; then let your course be a little more northerly, passing between the Borneyra Shoal, or Cangas Rocks, and Cape de Mar, or Alas, toward the road of Vigo.

The beach of Vigo is clean, and there is a good depth of water before it; the usual anchorage is in from 13 to 8 fathoms, muddy ground; vessels commonly moor with their best anchor to the north, and the other to the south, by which they ride well sheltered from the sea on the west, by the Cies, or Bayona Islands. Nevertheless it is asserted, that off the village of the Teis, about 2 miles higher, the anchorage is safer; here they make fast a cable on shore, and carry out an anchor to the northward, lying then in 6 fathoms. The hill on the west side of the Cove of Teis is high, round, and steep, having a reddish appearance. To the eastward of Randa Point, which is 2 miles above the road of Teis, many vessels may anchor in from 16 to 6 fathoms, on a bottom of mud, and safe from all winds; while above this part, ships coming in without cables or anchors, may run aground anywhere on the mud, until necessaries can be procured, where they can be lightened, and got off with safety.

Should adverse winds oblige you to turn in through the south channel, take care to avoid the *Shoal of Laxes*, which is to the southward, and the dangerous *Rocks of Boeiro*, off the southern island of Cies; when you have passed these, you may proceed at pleasure.

A sunken rock at the entrance of Vigo.—The *America*, 50, Captain Sir Thomas Maitland, got on shore on a pinnacle-pointed *rock*, lying about ¾ of a mile S.S.W. (true) bearing from the centre of the Boeiro Rocks off the south end of the Bayona Islands at the entrance of Vigo. She had the head pilot of Vigo on board at the time. The rock was not known to exist before; there were 15 fathoms close to at the time the ship struck. She drew about 20 feet. This appears from the chart by Don J. F. Florez, Captain, Spanish Navy, to be a rock of 9 feet, which is called Los Castros.

There is a small channel between the Bayona Islands; to pass through which, bring the north end of the southern island on with the chapel of N. S. del Alva: and when you have thus entered the channel, run midway through it, right up the bay. Good water may be obtained, but the supply of wood is scanty.

* On the 20th of February, 1857, the mail steamer *Madrid* struck on a *rock*, while rounding Point Hombre, at 2h. 15m. p.m., and was lost; this rock was said to be two ships' length off the point.

The harbour of Bayona lies on the southern side of Vigo Bay, and behind the isles of Estela; it is small, and filled with *shoals*. You will find shelter to the S.E. of Point Tenaza, off which some *rocks* project. Here are the walls of a large castle, below which the town is situated. This place should not be attempted without a pilot.

From Point Tenaza the coast runs south-westerly to Cape Silleyro, all steep to and foul; the cape is high and rugged, but its top nearly level; from it runs out a *ledge of rocks* N.N.W., ¼ of a mile, which the sea breaks over. To the eastward, on an eminence, is the Chapel of Nostra Senora de Cela. From the breakers of Cape Silleyro the coast runs S. by W. ½ W. to Point Montador, which has some *rocks* before it, and to the southward of this point is the town of Oyo and a battery; 3 leagues to the southward of Cape Silleyro is the hill of La Guarda, having a small town and creek at its foot, frequented chiefly by fishermen. To the S.S.W. the land is lower, until you reach the sugar-loaf hill of St. Teda, having two peaks, on the highest of which is a chapel, serving to point out the situation of the River Minho, which here divides Spain from Portugal.

The following directions for entering VIGO BAY, have been extracted from the *Nautical Magazine*, of October, 1840:—*

SOUTH CHANNEL.—The marks given in the former directions are frequently very bad to make out, and in thick weather cannot be seen at all. Therefore, as the *rocks* on the starboard hand are always plainly to be seen, adopt a course more in mid-channel, which pilots do, and then steer E.N.E. In the south channel, too, it is as well to observe, that if immediately after passing Boeiro Rocks, you should haul up for Cape Bicos, and running for which, in very bad weather, your best way would be, if near night, to anchor under the islands. Some *rocks*, which only show themselves at low water, would be passed very close indeed. For entering the south channel by night, an observation or two may be useful. Pass Cape Silleyro (coming from the south is here understood), at a moderate distance; steer N. by E. till you get Cape Bicos (of the south island) in such a position, that by shaping a course N.E. by E. you will have it a little open on the port bow; this course will take you safe into the middle of the bay. If coming in from seaward bring the south end of the island E.S.E., steer for it, and then you will not fail to make Boeiro Rocks, which you will then round at any convenient distance, and you have your exact position.

NORTH CHANNEL.—To enter Vigo by the north channel, pass near the island of Onza; steer S. by E., or S.S.E., according to your distance from it, till you bring Mount Ferro quite open in the passage between the island and the main; the mount will then bear south, a little westerly, and is a black round hill on the south side of the bay. Steer for it, and when in the passage, edge over to Cape del Hombre and Subrido Point, giving them a moderate berth. When Cape del Mar comes well open of Subrido Point, bearing S.E., steer S.E. by E.; this is a point only to be made out by being one with *the only low sandy patches* in that direction. Steering about this course 3½ miles, keeping the sea open astern of you, between the Subrido and the islands, if on approaching Cape del Mar, the sea is only just kept open, you will be in the right channel, and clear of the rocks which run out from that cape; this is useful to observe in the night, as it insures you of being clear of the dangers on both sides; you will open Cangas Church, clear of Point Farrequira, when you are clear of the shoals off it, and you may steer for the Chapel of N. S. de la Guia, which will bear east, and lead you right up to abreast of the town of Vigo, where you may anchor, in 5 fathoms, very near the shore.

Leaving Vigo, steer for the middle of the south Bayona Island, about west; if for the north channel, take care not to lose sight of Cangas Church before you open the sea. When Cape del Mar is passed, if for the south channel, a course between W.S.W. and W. by S., according to the distance at which you pass Cape del Mar, will carry you right out to sea, distant 10 miles from Vigo Town; the distance from sea in the north channel being 7⅓ miles. High water in the bay, full and change, at 3 o'clock; there appears to be only a very moderate rise and fall, the tide scarcely perceptible.

* These directions were written previously to the establishment of the new lights.

THE COAST OF PORTUGAL.

FROM THE RIVER MINHO TO THE RIVER GUADIANA.

The RIVER MINHO, (pronounced **MINIO,**) is navigable, but its entrance is rendered dangerous by *two bars*, formed by an island before it. On the southern bar are 7 feet at low water, but the northern one is shallower: a pilot is therefore always necessary. On its southern bank stands the little town of Camiña, in latitude 41° 52′ 42″ north, and longitude 8° 44′ 30″ west. From Mount Tecla to Cape Viana, the coast runs S. by W., about 4 leagues; it is of moderate height, but rises behind to a range of mountains higher than those to the northward, and visible 16 or 18 leagues off, forming a good object to know this part by, when coming from sea.

Cape Viana is the north point of the River Lima, Cape Nivos being its southern point. The town has a white appearance, and stands on the north side of the river. From Cape Viana a *reef* runs out a mile southerly. When about to anchor, bring the town to bear E.N.E.; but to enter the river you should have a pilot, for the bar is both shallow and *dangerous*. Here a low shore begins, extending southerly a full league; it then becomes somewhat higher and even, but lined within by ranges of hills, as far as Villa del Conde. Here some white buildings mark the entrance to the river, where the town stands. Within this space are the towns of Espozende and Fao, between which runs a small river, with about 6 or 7 feet water; opposite the town of Fao are two *ledges of rocks*, running out 1½ mile, even with the water's edge, called *Cavallos de Fao*. Come not closer to the shore in passing than 14 fathoms; but if to the southward of them, you may lessen your water to 9 and 8 fathoms.

Villa del Conde is the bar-haven of the little River Ave, and has several *rocks* scattered about its entrance; but ships may sail among them on every side; the narrowest channel is on the northern side, having 5 and 6 fathoms water. Further in is a *bank* crossing the haven, with only 2 fathoms upon it at high water; but within this bar the haven is 3 and 4 fathoms deep; the north side is filled with *rocks*, under water; but on the southern side are 5 and 6 fathoms, and round the mouth of the river are 9 and 10 fathoms. This place may be known by several white buildings at its entrance. A pilot will always be found necessary.*

A lighthouse is established at Pavoa de Varzim, about 2 miles north of Villa de Conde, 100 paces distant from the sea-side, and 160 feet above the level of the sea. A little to the S.W. of the light is a *long ridge of rocks*, and 3 miles S.W. of the light is a large *sunken rock*, a mile in circumference, upon which are heavy breakers in bad weather; soundings 10, 6, and 8 feet.

The light revolves only one half round to the south, and half to the north, and seen

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* A BANK OFF VILLA DEL CONDE.—The following particulars of it are from the remarks of H.M. ship *Orestes*, Captain Glascock:—At 6h. 15m., P.M., when in stays, and hauling the head-yards, the ship struck the ground twice in a few seconds, with the north part of the village of Villa del Conde bearing E. ½ N.; south part of ditto E. ½ S.; off shore 3½ miles. This bank is steep-to, as at a cable's length no bottom could be obtained with the hand-line. To avoid this shoal, ships in the neighbourhood of Villa del Conde should not approach the shore nearer than 4½ or 5 miles.—*Nautical Magazine*, vol. iii. p. 520.

In the *Nautical Magazine*, vol. ix., p. 687, there is a *bank* said to lie off this coast, not to be found in the charts, which, in moderate weather, is covered with fishing-boats anchored upon it, and supposed to lie further off the land than the bank above mentioned.

from the westward little difference in the movement can be observed, and is of the natural colour. The light has been erected as a guide to the fishing boats belonging to Pavoa, and is only lighted when they are out at sea.

Steering southerly, 10 miles from Villa de Conde, you will perceive the great *rocks* called the *Leychoes*, always above water, between which and the main is a passage with 6 and 7 fathoms; and about ½ a league S.W. of these rocks, lies a *rock* under water, named *Filgueyra*. You will then distinguish, at about a league's distance from the Leychoes, Fort Queijo, which is black, standing about 1½ mile to the northward of the entrance of the River Douro.

OPORTO SIGNALS.—*Oporto, November 23rd*, 1849.—Sir, I beg to inform you that the Directors of the Commercial Telegraph, established in this city, have directed the following signals to be made from the lighthouse establishment at the Foz, of the Douro, for the information of ships off, and bound to, this port; to commence on the 1st of December next:—

Two balls at the mast-head.....Keep to the north of the bar.
Three balls at mast-head .....Keep to the south of the bar.
Three balls at yard-arm .....12 feet on the bar.
Two balls at yard-arm .. ..11 feet on the bar.
Two balls at mast-head, and one at yard-arm..10 feet on the bar.

The following signals, which I had the honour to communicate to you, under date of the 7th of May last, also continue in use:—

One black ball at mast-head ... .The coast is dangerous, put out to sea.
One black ball at mast-head, and one at the extremity of yard-arm ..... } Vessels in sight cannot be piloted.
A black ball at each end of yard-arm ....By coming near you may be piloted.
A black ball at mast-head, and one on each yard-arm..... } Make for the bar.

(Signed) THOMAS C. WIGHAM,
Agent for Lloyds.

OPORTO.—This is a large city, standing on the north bank of the River Douro, about 3 miles within its entrance; it is built partly on a steep hill, and partly on the banks of the river. There is a quay extending the whole length of the town, on one side of which is a street, and on the other a wall, raised for the purpose of fastening ships' cables.

The city is well built, and rises from the strand in a broad-paved street, with causeways on each side, leading to two other handsome streets; great part of the buildings are light, neat, and regular, forming the cleanest and most agreeable town in Portugal; whilst in population and trade it yields only to Lisbon. Oporto has long been famous for the exportation of a wine called Port; although this wine is not the produce of this place, nor even of its environs, but comes from the provinces of Tras los Montes and Entre Douro e Minho. The lesser articles of export are oil, sumach, oranges, and linen. The chief imports are woollen, cotton, and hardware from England; fish, both from England and Newfoundland; hemp and flax from the Baltic; and rice from America. This place is much frequented by the English, many of whom are residents. The River Douro is sometimes, by the rains or melting of the mountain snows, swollen to such a torrent, that booms are obliged to be placed on the quay, in order to secure the vessels' safety, for no cables will then hold them.

The roadstead of Oporto is spacious, and occasionally the rendezvous of numerous merchantmen. The harbour is good when you are within it, but a dangerous *shifting bar* stretches across its entrance, and renders it absolutely necessary to employ a pilot. Should bad weather prevent them venturing out to take you over the bar, no vessel should attempt entering; and unless the atmosphere is clear, the marks cannot be seen.

The town of Oporto is remarkable for having a black steeple (Torres dos Clerigos) near its centre, which may be seen at 4 or 5 leagues off. As you approach the land, the town of St. Joaõ de Foz will be seen near the mouth of the river, also the Chapel of Nostra Senora de la Luz, and near it a lighthouse, exhibiting a *fixed light*.

On the north point of the entrance is the Castle of St. Joaõ de Foz, in latitude 41° 8′ 48″ north, and longitude 8° 37′ west, from which extends a *ledge of rocks* to the S.W., some of which are always above water. Without these is another *ledge*, called *Filgueira*, always visible, and to be left on the port side when entering the river. To the southward of these is a *sunken rock*, called the *North Lage*, and further south, at the distance of 14 to 16 fathoms, is the *South Lage*. The entrance to the river is between these rocks. After having passed the bar, you will see a *rock*, upon which is built a small round tower, at the end of a *reef*, running out from Ango Dome, called de Cruz, or Pilaa; also another *rock*, named *Agulha*; to the southward of which is a long *ridge of rocks*, forming a breakwater. On the south side of the entrance is a low sandy point, called Cabedello, stretching to the northward to within about a cable's length of the northern shore: this forms the shifting and dangerous bar at the entrance.

Vessels intending to enter the River Douro should be well assured of their latitude: and it must be remembered that, with south-westerly and north-westerly winds, a heavy sea sets all along this coast.

The bar is liable to frequent alterations from gales of wind, the sudden swellings of the river, called freshets, or freshes, &c.; and, as before observed, no stranger should attempt to enter the river without a pilot. The pilots are generally fishermen of the port. You first enter with the Chapel of St. Catherine in a line with the Lapa Convent E. ¾ S., or Anjo Dome on with the bar mark, which is a white tower half-way up the hill behind it; and thence proceed according to circumstances.

The freshets, before mentioned, most frequently take place in the spring of the year, and proceed from the melting of the snow on the mountains of the interior. The rise of the water in the river at such times is frequently as much as 40 feet, and the rapidity of the stream is so great as to break vessels adrift from their moorings, and occasion their total loss, it being impossible to afford them the smallest assistance. As no dependence can be placed on the anchors in these times of danger, precautions are generally taken by the masters of vessels to secure the end of a cable to trees on the bank of the river, or to stone pillars which have been erected for the purpose. They have ample time for preparation, as the approach of one of these freshets is communicated from the interior several days before its arrival, during which time the river gradually swells, and attains its greatest height. The ordinary rise of spring-tides is from 10 to 12 feet, and that of neaps from 6 to 8 feet.

Directions for vessels bound to OPORTO; *by* MR. GEORGE GIBBENS.

"I should recommend all vessels bound to Oporto to make the land to the northward of the port, as the wind generally blows from that quarter upon the coast of Portugal; and vessels getting to leeward of the port will find it difficult to beat up, as the current there generally runs to the southward with the direction of the wind, and to the northward of the bar the current sets to the northward; but the wind in that direction will enable her to run down and make the port accordingly. A vessel to windward of the bar will hold to windward under her top-sails, while one to leeward cannot gain ground with all her canvas set.

"A vessel making the land, as recommended, to the northward of Oporto, will observe the high land of Viana, which is very remarkable, and if anything to the northward of Viana, a very remarkable hill, of a conical shape, will be seen; this is called Mount Tecla, and lies at the entrance of the Caminha River (River Minho).

"From Viana to Oporto, the land by the sea shore is much lower. The first place of any significance, after passing Viana, is Villa de Conde, there being a very

remarkable large square white building, forming a convent, which has an aqueduct a league in length attached to it; there are also several churches and a fort at the entrance of the Rio Ave. This place has often been mistaken for Oporto; and in fine weather, there are generally a great number of fishing-boats cruising about, the men belonging to which often induce strangers to take them on board by telling them they are pilots for the coast; but their services are of no acquisition when on board. It is requisite to know, that the regular bar pilots for Oporto are not of any service should you have to keep the offing, for, added to their little intelligence in such cases, they are generally not inclined to take any charge.

"About 4 leagues to the southward of Villa de Conde, lie the towns of Leca and Matozinhos, which, seen from sea, appear as one town; a small river runs between them, having a fort at its entrance. When first observed to the northward, this place appears very much like the entrance of Oporto. About a mile from the shore lie the *Leychoes Rocks*, above water, and from thence the lighthouse and town of San Joaõ de Foz will be distinctly seen, with the castle at the entrance of the Douro.

"As soon as you get sight of the town of San Joaõ de Foz, the signal should be made for a pilot, in order to give the boat time to get off; you must then run pretty close down to the castle, as the boats will not come far out; but care should be taken not to get to leeward of the bar, for, as before observed, there will be great difficulty in beating up again.

"When a square red flag is hoisted at the castle, it is a signal for ships to make for the bar; if there is a burgee hoisted with a red flag, it is a signal for vessels not drawing more than 10 feet water.*

"When vessels are running for the bar, and a gun is fired and the flag lowered, it is a signal to keep off; but should a gun be fired and the flag kept flying, it is a signal to make more sail.

"When taking the bar, particular attention should be paid to the braces; the entrance being so narrow, and frequently a counter-tide running, makes it difficult to steer the vessel.

"There is good holding ground off the bar. The usual place for anchoring is with the lighthouse bearing E. by S., in 12 fathoms, on a bottom of mud and sand; but in winter, without the weather is remarkably fine, ships should not anchor, for at that season the wind sometimes shifts suddenly to the S.W., and blows so heavily, that vessels have been frequently obliged to leave their anchors.

"When cruizing off the bar, great attention should be paid to the lead in hazy or thick weather, which is very prevalent on this coast when standing off and on the land; it has frequently happened to vessels standing off for 4 hours, and tacking, have found themselves set in-shore again in little more than half the time. To the southward of the bar, with moderate weather and a smooth sea, you may stand into 11 fathoms; to the northward of the bar you ought not to go nearer than 18 or 20 fathoms.

"Close to the entrance of Oporto there is a round hill, with a small white chapel, and three or four trees upon the top of it. It has a very remarkable appearance, and is an excellent mark for the bar when coming in from sea; when it bears E. by S. you are nearly abreast of the bar.

"Should a vessel be running for the bar when the flag is up at the castle,† and the sea so heavy that the boats cannot get out, she should run until the Torres dos Clerigos (which is a tall spire in the City of Oporto, and the only one) comes in the middle of the two hills, one on each side of the Douro, bearing about E. by S.; run in with this mark until you can see the boats inside the bar, one of which will wave a small flag attached to a long pole.

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* We are not certain if these signals are still retained; see those given in page 17.

† No vessel should attempt the bar without the flag is up at the castle.

"At the lighthouse there is a telegraph, and vessels having the New Commercial Code and Marryat's signals can communicate with the shore. The light is fixed, and may be seen in clear weather 5 or 6 leagues off.

"It is high water at Oporto, on full and change, at ½ past 2 o'clock; spring-tides rise about 12 or 13 feet.

"The sea-shore from Oporto to Cape Mondego is very low and sandy, and clear all the way; but inland the land rises to a considerable height. You may reach into whatever water you please off Aveiro; at a league off shore you will have 8 fathoms, with a sandy bottom."

The following Observations on the Bar and Harbour of Oporto, have been extracted from the Nautical Magazine of December, 1832.

"The first precaution to be observed by vessels bound to Oporto, is to be certain of their latitude, as there is great sameness in the appearance of the land, and the towns to the northward of Oporto are seen at a great distance. Oporto may be known with the assistance of the latitude, by its being situated about 3 miles inland, and partly built on a small eminence, with the black steeple of Torres dos Clerigos in the middle, and Foz before it, on the sea-shore. No vessel should attempt the bar without a pilot, as it is constantly shifting, and the freshes render it extremely dangerous. Mr. Charles Gahan, the second master of H.M. brig *Royalist*, informs us, that vessels are frequently prevented entering the river for three or four weeks at a time. In addition to which, Mr. H. J. Strutt, master of H.M. ship *Victor*, commanded by Captain Ellice, says that no vessel drawing more than 15½ feet of water can pass it at any time.

"On the extraordinary and dangerous freshes to which the River Douro is subject Mr. Strutt makes the following useful observations:—'It is, perhaps, superfluous to observe, that the great extent of this river, the steepness of its banks, narrow bed, and debouchure, as also the number of streams tributary to it, make it liable to considerable irregularity in rise and strength of current. Now, the seasons here are tolerably regular; the rains are heavy, continuous, and general; thus the river is occasionally swollen above its accustomed level. Again, during the prevalence of W. and S.W. winds, to which its entrance and principal direction is exposed, its stream is more or less impeded; as those winds cause an accumulation of sand along the shore to seaward, and upon the rocks, which are the fundamental basis of the bar. Thus arises its liability to freshes; the strength, duration, and importance depending upon the conjoined operation of some, or all, of these causes. The periodical fall of the stream being overcome, and a gradual rise continuing for 2 or 3 days, is a certain indication of one being at hand; and when the waters begin to find vent, before the commencement of the run is perceptible, the middle of the river is covered with rubbish, patches of foam, &c. The *Victor* experienced one, accompanied with about 10 days' rain, with little intermission, and those chiefly drizzling. During that time the wind was westerly, but neither very strong nor steady. The first indication of it, viz., the loss of tide, was observed 2 days before the rubbish and foam; the day following it attained full strength, and subsided on the third morning afterwards, to the usual strength of current. We had 4¾ knots alongside; in the middle of the stream it was of twice that velocity. There can be but little doubt that the strength of this fresh is often very much exceeded, especially in the spring of the year, when a sudden thaw on the mountainous tracts, which border the river, occasion the descent of a great body of water. At all events, the utmost precaution for the holding of the vessel is indispensable; for the bottom is of light soil, soft, but not tenacious, and appears to be considerably agitated; and, strange as it may be thought, two vessels on the opposite shore had their bowers in the stream washed astern, a circumstance which is stated to be not uncommon at such times, owing to its rapidity.

"The following precautions, adopted by the *Victor*, may be useful to vessels. The anchorage taken up by this vessel was about a mile west of San Joaõ da Foz, in 13 fathoms of water.

"August 12th, 1832.—Having had much rain, and missing the accustomed fall of the river, completed preparations for a fresh, having a small bower, with 65 fathoms of chain in the stream, on the port bow, the best bower buried on shore with a chain, and a hempen cable clenched round a tree, on the starboard bow. Stream anchor with 50 fathoms of chain, on port quarter (in the stream); stream hemp, and a 4½-inch hawser on the starboard quarter, to the shore, with spare messenger, and a warp for breast-fasts. The vessel drifted into little more than her own draught, with the rise of the water."

"*We will now give Mr. Gahan's directions for the guidance of vessels in the Douro.*

"During the summer months, the best anchorage is off the city, 50 fathoms below the rocks, which show at half-tide; there being no other rocks near this place, it cannot be mistaken. Moor head and stern, your small bower anchor ahead, and stream astern; heave as close as possible to the south shore, by a head and stern hawser, made fast to the shore. But on the least indication of a fresh, such as having a continuance of heavy rain, or a fall of snow on the mountains, (more particularly the latter, when thawing), you must immediately move below St. Antonio de Val de Piedade Convent.

"The following are the marks for anchoring: Sara Convent, which is situated on a hill above the bridge, just open of St. Antonio Point, which is a short distance outside St. Antonio de Val de Piedade Convent, bearing S.E. ½ E.; old burying-ground point, N.W. ¾ N.; a large yellow house, in a valley, among some trees on the south side, S. by W. With these bearings and marks on, you will be in not less than 20 feet, low water spring-tides. The ship's head being S.E., the small bower anchor is to be let go in 50 fathoms, one point on the port bow; the stream in 70 fathoms, one point on the port quarter; the best bower cable to be made fast to the bower anchor, which must be taken on shore, and buried in the quay three points on the starboard bow; a hawser from the starboard quarter to the shore, and a good hawser or stream cable from the starboard bow to the shore, to heave-in shore by; all cables to be hove well taut. Particular attention should be paid to the rise and fall of the tide, taking care to heave in shore immediately it rises, and remains above high-water mark, as there is scarcely any ebb for one or two days previous to a fresh. Every precaution should be taken to prevent the vessel sheering as you heave in, keeping booms ready to boom off from the shore; a strict look-out should be kept, to ascertain when the water begins to fall, taking great care to heave off when it does so. After a heavy fresh, it would be advisable to sight your anchors, or in all probability you will lose them. The rise of water in a heavy fresh is 20 feet above high-water mark; the general rise and fall in the river, as far up as the town, is 12 feet."

AVEIRO.—From Oporto Bar the coast runs nearly in a S.W. by S. direction as far as Aveiro, a distance of about 10 leagues; the land, immediately to the southward of Oporto, bends eastward, and forms a kind of bay, being near the sea, of moderate elevation, but rising high inland. The beach is flat, and extends southerly as far as Cape Mondego, in latitude 40° 12′ north, and longitude 8° 54′ west; it is clear from danger, and at the distance of 1½ mile you may safely run along it, in 9, 10, 11, and 12 fathoms. No remarkable object, except a few fishermen's huts, and a white house, called Casa Branca, situated about 4 leagues from Oporto, is perceptible on the shore all the way to Aveiro, and that only can be discovered when you are very near the land; the town lies a considerable way up the river.

PORT OF AVEIRO.—*Portuguese Consulate, London, May 28th*, 1850.—Sir, I beg to acquaint you that the two landmarks formerly at the bar, at the entrance of the Port of Aveiro, have been removed, and instead thereof, there has been built in the fort on the *bar*, a circular signal tower, whitewashed, being 22½ palms in diameter at

its base, and its top is 103 palms above the level of high water. The tower is 900 fathoms east of the bank of the bar. The old landmarks were, one on the north, and the other on the south, and nearly distant from each other 756 fathoms, and from the signal tower, one 614, the other 576 fathoms.

(Signed), F. I. VAN ZELLER.

To CAPT. HALSTEAD, R.N., *Sec. for Lloyds.*

Aveiro River has a *bar of sand* before it, which frequently shifts, and therefore a pilot becomes necessary. In order to distinguish the entrance of the river, a circular signal tower, whitewashed, has been built in the fort on the bar, the top of which is 103 palms above high water. When you come near the *bar*, you may anchor, but will generally find the current very strong; but there can be no settled directions given for the entrance to this place, on account of the unsteady nature of the sands; and no vessel can safely pass in without a pilot. The small town of Aveiro was, until lately, of no importance, but now carries on a considerable trade, and many English families are settled there: the exports are principally oil, salt, and fish, especially sardels.

At high water, spring-tides, there are 14 to 15 feet over the bar, but at neap only 11 to 12, the perpendicular rise being about 6 feet.

CAPE MONDEGO LIGHT, in latitude 40° 11′ north, and longitude 8° 55′ W., is a *fixed white light*, elevated 300 feet, and visible 20 miles from S.S.W., round westerly to N.N.E.

Mariners coming from the north should not steer to the south of S.S.W., until they round the cape, if bound to Figueira. The coast between Cape Mondego and Aveiro is more dangerous than it is generally understood to be; at some distance from the sandy beach which extends from the one to the other, banks of sand at intervals form at some distance from the shore, caused by the influence of the winds or the currents, and disperse and form again at other points along that coast, on which vessels in fine weather have grounded. There is good anchorage for vessels on the south side of Cape Mondego, with the wind from N. to E. opposite to the fishing town of Buarcos.

The hill of Cape Mondego bears S.W. ½ S., distant about 27 miles from the entrance to Aveiro; its summit is flat, and at a distance has the appearance of an island; upon it is the signal of Buarcos, 720 feet above the level of the sea; a *reef* extends from the S.W. side of the cape, more than a cable's length to the S.W., therefore you must give the land a good berth. The land, after you have passed the cape, bends to the eastward; and with off-shore winds, good anchorage may be found when the cape bears north, distant 5 or 6 miles, on a bottom of fine sand, or with the cape bearing N. by W., distant 4 or 5 miles; but should the wind get to the southward, you must weigh immediately, and stand out to sea, for westerly gales generally commence from the southward, and send in a heavy sea: these winds are frequently of long duration, and occasion many accidents; therefore do not get into less than 18 or 20 fathoms, or to the northward of the cape than 35 fathoms, which will be above 4 leagues off; the soundings gradually decreasing towards the shore. Abreast of the cape are 7 fathoms; a little further off, 20 fathoms; and at about 7 miles' distance, 30 fathoms, brown sand and shells.

S.S.E., 4 miles from Cape Mondego, are the town of Figuera and the Fort Sta. Catherine, lying on the north bank of the River Mondego, having first passed by Buarcos, opposite which is a roadstead, where you may ride in 6 and 7 fathoms. Pilots may be had to conduct you over the bar of the Mondego, which frequently shifts its position, and at low water often has not more than 6 feet over it. Upon Fort Sta. Catherine a signal flag is exhibited, to show that vessels may enter the river. This flag is lowered or struck when the sea is so heavy that pilots cannot go off, or when the water is not sufficiently high to allow vessels to enter the river. When a gun is fired from the fort without hoisting the flag, it is a signal to vessels

to keep their station, or prepare for entering; and when the flag is afterwards hoisted, it denotes that there is sufficient water for passing over the bar.

From Cape Mondego the coast trends in a south-westerly direction to Cape Carvoeiro, a distance of 18 leagues; the coast is moderately high, but the interior mountainous. Cape Carvoeiro is steep, and projects considerably to the westward, having a large *rock* before it, the Chapel of N.S. de los Remedios on its summit, and a lighthouse, in latitude 39° 21′ 50″ north, and longitude 9° 25′ west, at its western point, with the fortified town of Peniche on the east side of the Peninsula, which might be made almost impregnable. This is now a fixed light; the alteration was made in October, 1846, with the object of enabling seamen to distinguish it from the revolving light on the Berlings, and the new revolving light on Cape St. Vincent. Within this space is the small bay of Pedernal, or Pedernera, fit only for coasting vessels, and known by the Church of N. S. de Nazareth. About 3 leagues north-eastward of the cape is the town of Foz, on the north side of the entrance to the Lagoon of Obidos, which is only frequented by fishermen; and at nearly 2 leagues further to the northward is the bay of St. Martin.

On the east side of Cape Carvoeiro is a tract of low flat land, which appears, as you sail along, to separate the cape from the main, giving it the appearance of an island; be careful of this appearance, for in thick weather vessels have been known to mistake it for the Berlings, and advancing on this apparent opening, have run on shore, and been lost.

BERLENGAS, or the BERLINGS, lie to the north-westward of Cape Carvoeiro; the south point of the Great Berling being N.W. by N., 5 miles from the cape; on the summit is a watch-tower. The island may be seen, in fine weather, 20 miles off. It is advisable, when you make the Berlings, to look out for the *Farilhoens*, which are some *high rocks* lying to the northward of the Berlings; and you will observe the proper channel is broader east and west than the flat we have been speaking of. The Great Berling is an island of moderate height, level at the top, and lies in latitude 39° 24′ 40″ N., and longitude 9° 31′ W., but has a hollow or cove about the middle; the shores are steep, except on the east side, where a fort is built; opposite this, vessels may ride with N.W., west, and S.W. winds, and obtain plenty of excellent fresh water; but if the wind is from any other quarter, this will not be found a safe place for anchorage.

Near the western side of the Great Berling is a *high rock*, with a *cluster of smaller ones* running out about a mile to the south-westward of it; these are called the *Estellas;* and on its N.E. side is *another high rock*, called the *Farilhas de Velha.* About 5 miles north from the Great Berling is the Great Farilhoen; it is a broad, round, ragged rock, nearly as high as the Berlings, with a number of small ones around it, both above and under water. About ½ a mile to the eastward is the N.E. Farilhoen. A LIGHTHOUSE has been erected on the Great Berling; first lighted in July, 1842. This tower is 75 feet high, and the lantern 25 feet; the latter 365 feet above the level of the sea. The light revolves, and shows its brightest glare every 3 minutes, which lasts 12 seconds, and may be seen 7 or 8 leagues. On the west side of these are some *sunken rocks*, on which the sea breaks at low water.

The channel between the Berlings and Cape Carvoeiro is nearly 6 miles wide, clear of danger, with from 14 to 24 fathoms water. Cape Carvoeiro cannot *easily* be mistaken for the Berlings, neither can the Berlings be mistaken for Cape Carvoeiro; for the Farilhoens (which may be seen when coming in with the Berlings) will strikingly mark the distinction between the cape and the islets.

On the east and north-east sides of Cape Carvoeiro, at the beginning of the low land, lies the upper town of Peniche; and on the east and south-east sides of the cape is the lower town. Here begins a flat bay, ending in a rocky point, on which stands the Castle of Anparo, or Consalacio; in this little bay a vessel may anchor with the winds from the E.N.E. to N.N.W., but not with any other. About 11 miles to the southward of Cape Carvoeiro is the town of Vimeiro, having a small rivulet. At 14 miles beyond this, the whole of which is a flat sandy beach, are Ericeira town and

bay; a league inland from which town is the village of Mafra. Here, situated on a hill, and forming the most remarkable object, by which this part of the coast may be distinguished, is the most magnificent building in all Portugal, and built of white marble.

At 4 leagues from Ericeira, and 12 leagues S.S.W. ½ W. from Cape Carvoeiro, is Cape Roca, or the rock of Lisbon, upon which a lighthouse is erected. The light exhibited from this lighthouse has been altered from a fixed to a revolving light, each revolution being completed in 1 minute 45 seconds. During the first minute it will present a red light, the greatest intensity of which will continue 30 seconds, and during the second minute, it will present a bright light, the greatest brilliancy of which will also continue 30 seconds; the altitude being 598 feet above the level of the sea: it may be seen, in very clear weather, at the distance of 7 or 8 leagues.

The cape, in latitude 38° 46′ north, and longitude 9° 30′ west, is broad, moderately high, and steep-to, rising perpendicularly from the sea; near it is a high *rock*, and close in is a *sunken rock*, over which the sea breaks, although near its outside are 40 fathoms. The country suddenly rises inland to a remarkable mountainous ridge, running easterly, with several irregular risings, having on its northern slope the town of Cintra, from which it takes its name, and is a good mark to recognize this part of the coast.

S. by W., 4 miles from Cape Roca, is Fort Sanxete, or Cape Raza; it is low and rocky, the intermediate land being rocky and steep; and from thence to the Castle of San Julian, it continues steep, but clear of danger, except at Point Rana, where there is a *rocky shoal*. You will, in advancing towards the Tagus, perceive the lighthouse, which shows a fixed light, at N. S. de la Guai, elevated 207 feet, and visible 12 miles, and further on, the fort, town, and bay of Cascaes; here abreast of the town, is good anchorage, within 8 fathoms; the road is sheltered from N.W., north, and N.E. winds. In running in for it, bring the town open with the castle and point; where a pilot may be picked up.

S.E. ¾ E. 4½ miles from Cascaes Fort, is San Julian's Castle, conspicuously erected on a high projecting point, which has a small *reef* before it; near the centre of the fortress a lighthouse is erected, showing a fixed light, 128 feet above the level of the sea, and visible 12 miles. This part may be considered the northern point of the Tagus River. The entrance of the river is encumbered with *shoals* and a *bar*, which renders it difficult to navigate, and requires the assistance of a pilot.

On a fort at Belem Castle, which is 5 miles within St. Julian's Castle, is a fixed *red* light, elevated 30 feet, and visible about 6 miles.

The CITY of LISBON is the capital of Portugal,* and beautifully situated on the northern shores of the River Tagus, which here is 1¼ mile wide, between Fort San Julian and the Bugio Fort. It is built upon three hills: the most westerly begins at a small river flowing between the city and the Castle of Belem; this part, which was formerly gardens and corn-fields, is now covered with houses. The

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* LISBON.—NOTICE TO MARINERS.—*Portuguese Consulate, London, January 25th* 1849.—It has been decreed by Her most faithful Majesty's government, that the practice observed of granting dispatches for the re-exportation of goods imported to order, is contrary to law, and that in consequence, all such goods in future which shall not be entered in the precise terms of the first article, fourth chapter, of the decree of the 10th of July, 1834, here copied below, shall not be entitled to such dispatch, but be entered for consumption only. This after the term of 60 days.

DECREE.

"All captains of merchant vessels, whether national or foreign, who enter the port of Lisbon, must bring two manifests of the same tenor, containing the name and tonnage of the vessel, to what nation she belongs, the port in which she received her cargo, names of the shippers, and of the parties to whom they are consigned, specifying the quantity and quality of the packages at full length, with the marks and numbers in the margin."

second hill is only separated from the first by a narrow valley, the prospect from which is very fine.

By an official notice, dated Lisbon, November 26th, 1841, the two pilot-boats stationed at the bar, to furnish vessels bound to this port with pilots, will henceforth bear a blue flag, hoisted at the extremity of the yard, instead of the pendant hitherto used by them; the latter being so easily mistaken for the pendant used as owners' signals.

The entrance to the Tagus is encumbered by *two shoals*, called the *Northern* and *Southern Catchopo*, forming the two channels into the river; the North, or Little Channel, being between the Northern Catchopo and San Julian's Land; and the Southern, or Great Channel, between the two Catchopos, constituting what is called the bar.

Five Buoys are laid down in the South Channel to mark the edge of the *shoals* on each side, viz:—*Two red buoys* on the southern side of the North Catchopo, $1\frac{3}{4}$ mile apart, bearing E.N.E. $\frac{1}{2}$ E. of each other; and *three white buoys* on the north side of the South Catchopo, lying in an E.N.E. direction $1\frac{1}{2}$ mile.

The North Catchopo is a *rocky shoal*, with from $1\frac{1}{2}$ to 4 fathoms on it; so that, with a swell of the sea from the westward, when the ebb-tide is prevalent, the sea breaks over it most furiously. It is shoalest towards its northern part, which is about a musket-shot from Fort San Julian; thence it extends west $2\frac{3}{4}$ miles.

The South Catchopo is still more *shoal* than the northern one, for its north-eastern part is always dry. On the middle of this bank, about S.E. by S., distant $1\frac{1}{4}$ mile from Fort San Julian, is the Bugio Fort; on the tower of which (St. Lorenzo) is a revolving light, 110 feet high, which revolves in 1 minute and 45 seconds, the duration of the strong light about 12 seconds, visible in clear weather 21 miles; this is an object you cannot possibly fail to recognise. At low water the Bugio appears to be erected upon a dry bank; but on the rising of the tide the water washes the very walls of the fortress. Between the South Catchopo and the shore there is a small channel, affording a passage for boats only.

The great danger in entering the Tagus is occasioned by the tides, which have caused the wreck of many vessels. Off the city of Lisbon the ebb-tide sometimes runs at the rate of 7 miles an hour, so that the anchors frequently come home. The flood-tide is commonly much weaker than the ebb.

Whenever a strong ebb is running down, and is opposed by a gale from seaward, there will be sometimes a complete breaking all over the bar. A vessel will, at such time, become almost unmanageable; but in the middle, or Great South Channel, the current sets directly through it. To enter during the ebb will require a brisk gale, and all sails set, in order to make any way; and you will find that, within the river, the wind comes very irregularly through the valleys on each side, unless it proceeds from west or S.W. It is, however, tolerably steady when in the direction of the river. The tide draws strongly towards the Bugio Bank, and divides the water hereabout into several counter-currents; so that a vessel approaching too near this bank will seldom obey her helm.

Directions for the River Tagus by Mr. George Biddlecombe, Master of H. M. Ship St. Vincent.

Anchorage in Cascaes Bay. The anchorage in Cascaes Bay is in from 10 to 12 fathoms, mud and sand, with Guia Lighthouse in one with Fort Santa Martha about N.W. $\frac{1}{2}$ W., and the town of Cascaes nearly open to the northward of Cascaes Fort, by which will be avoided the rocky irregular bottom extending from the fort. A vessel may lie in this road throughout the summer months, the wind being invariably from the northward; but immediately the wind comes from the southward, a heavy swell is thrown into the bay; in which case, she should either put to sea, or run through the north channel into the Tagus. Small coasting vessels

lie within Cascaes Fort, bringing it to bear W. by S., and being there protected from the westerly swell. Boats are hauled up on a sandy beach under the wall that continues from Cascaes Fort towards the town.

North Channel into the Tagus requires a thorough knowledge of the tides, and also a strong commanding breeze. Having passed Guia and Cascaes, steer in so as to bring Cacilhas Point (the eastern termination of the south shore) in one with the southern face of Fort San Julian; continue on that mark until Guia Lighthouse is brought in one with the angle or centre of the high part of Fort Santa Martha. Fort Santa Martha is now whitewashed, but formerly was of a yellowish colour. This is the mark for the mid-channel, and will not lead into less than 6 fathoms at low water.* When the centre of Mount Cordova (on the south shore), comes in one with Bugio Tower, bearing about S.E. ¼ S., steer for Bugio until Fort San Thomas (which is white), opens to the eastward of the Yellow Fort of Catelazeite, in order to clear the shoal off San Julian, but carefully allowing for the tides, as the flow sets right on the *shoal* to the S.E. of San Julian, while the ebb sets directly on the North Catchopo.†

South Channel into the Tagus. On entering the South Channel with a fair wind, and rounding the southern extremity of the North Catchopo, keep the Peninha (or western part of Mount Cintra), open to the westward of Cascaes Fort N. ½ E., until Bugio Fort comes in one with Estrella Dome E. ¼ N. Then steer towards Bugio, keeping it in one with Estrella dome, in which line the bar connecting the North and South Catchopo will be crossed in the deepest water, and in not less than 6½ fathoms; and when the *paps* are in one with Jacob's Ladder E.N.E. ¼ E. the *bar* will have been crossed, and the depth of water will have increased. Now run up with the paps in one with Jacob's Ladder, or, if the wind hangs to the northward, borrow as far as the northern turning mark, (the paps in one with Caxias E.N.E. ½ E.) On the contrary, if the wind be from the S.E., borrow towards the southern turning mark, which is the eastern pap touching the north-western end of the range of buildings at Boaviagem, and bearing about E.N.E.; but avoid going too near Bugio, as the tides there are difficult, and it is steep-to. Having passed between Bugio and San Julian, keep towards the north shore till Belem Castle is in one with the south part of the city of Lisbon, bearing E. ¾ S., which clears all the shoals to the northward of the sandy flat inside of Bugio. Pass Belem Castle at the distance of 2 or 3 cables, and then proceed to the anchorage, keeping the whole of Fort San Julian and all its outworks open to the southward of the parapet of Belem Castle, which will clear the *shoals* of Alcantara, until the vessel arrives off the Packet Stairs, where there is anchorage in from 10 to 14 fathoms, or further up in 12 to 16 fathoms, mud.

To turn through the South Channel into the Tagus.—On standing towards the S.W. tail of the North Catchopo keep Peninha Peak open to the westward of Cascaes Fort, (N. ½ E.), on which line there will not be found less than 12 fathoms, until the south part of the City of Lisbon is in one with Bugio Fort, E. ¼ S., and then hauling the wind stand on until the eastern pap touches the north-western part of the buildings at Boaviagem, bearing E.N.E., which is the southern turning mark. So long as the Peninha is open to the westward of Fort Velha you may cross over as far as that southern turning mark, but when the Peninha opens to the eastward of

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* Rana Church, in one with Quinta Nova, is a good mark to check a vessel's position when running through the north channel, with Cacilhas Point in one with the southern face of Fort San Julian; for she will then be in the very centre of the fairway, and have Guia Lighthouse in one with the bastion of Fort Santa Martha.

† The rocky ledge of Fort San Julian extends 90 yards from its south point, where a depth of 3 fathoms will be found, at low water, but in approaching it great caution is necessary, as the flood sweeps over it with great velocity. Quinta Nova open west of San Julian, clears it to the westward, and Catelazete Battery, Fort San Thomas, and the outer windmill in line, leads along its south-eastern edge in 3½ fathoms, and a cable's length to the eastward of the North Catchopo.—*J. Richards, Master of H.M. Ship Hecate*, 1851.

Fort Velha, it is unsafe to stand quite so far over, on account of the strong eddy which sets towards the South Catchopo, the edge of that shoal being in some places steep-to.* Towards the North Catchopo you may stand till the northern turning mark comes on, (the paps in one with Caxias about E.N.E. ½ E.), there the water is deep, and the flood tide sets straight up the channel, but remember that the North Catchopo is on that side steep-to.

Vessels working into the Tagus, when to the eastward of the bar and stretching over to the south-eastward, should keep Peninha open to the westward of the convent of San Antonio, (which stands nearly midway between Cascaes and Velha Forts), in order to be sure of avoiding the South Catchopo. On reaching into the south channel the remarks thereon must be consulted.

The 3½ fathom shoal off San Julian extends a short distance from the fort, but deepens immediately to 7 fathoms; Fort San Thomas N.E. by N., and well open east of the small battery of Catelazete, on the intermediate points, clears the south point of this shoal.

Having passed San Julian and Bugio, continue to work up the river to Belem, standing over to either shore as far as in to 12 fathoms; but a good mark for turning clear of the shoals on the southern shore, inside of Bugio is Belem Castle, in one with the citadel of Lisbon, which stands on the first rise of the land from the south point of the city. When so far up the river that the flagstaff of the Telegraph on the south-shore is in one with the steep bluff, to the eastward of Torre Velha; and crosses the last-mentioned mark, it should be then used for the southern turning mark, as it clears the bank in 10 fathoms, with 7 fathoms just inside. The edge of the shoal is very irregular along the shore as far as Trafaria; and abreast of Torrao, (a large white building in the bight,) it stretches out full half a mile off the shore. Near Trafaria, a rocky ledge extends a quarter of a mile in the direction of Caxias, and with deep water close to it. When above Trafaria the south shore of the river is clear, with deep water the whole distance to Cacilhas Point.

The shoal water on the north side of the river continues along shore to the eastward, about a quarter of a mile off shore, where there is a depth of 5 fathoms, to within a quarter of a mile of Belem Castle, and there the shore becomes so steep that a depth of 5 fathoms may be had at 200 yards from the castle, and 9 fathoms at 300 yards.

From Belem Castle, up the river, stand close over to the south side, which is steep-to; but if to the northward avoid getting into less than 12 fathoms, as an irregular shoal extends about 200 fathoms off shore, with 5 fathoms on its edge, and deep water close to it. When nearing the bight of Alcantara, this bank extends further out, and the mark for clearing it in 7 fathoms, is by keeping San Julian Castle and outworks open of the parapet of Belem Castle, until Alcantara, which appears like the angle of a fort with a watch-tower, bears N. ¼ W.; the shoal will then be passed, and the shore may be approached, until the Tower of San Julian is in one with the parapet of Belem Castle; and this is a good mark for an inshore berth in 7 or 8 fathoms off the packet stairs, as a line-of-battle ship will be quite far enough out, if she anchor in 12 or 14 fathoms, where good holding ground of stiff mud will be found, and where she will lie out of the strength of the tides.

TO ENTER THE RIVER AT NIGHT.

In entering at night, if coming from the northward, bring Guia Light to bear north, and run on that bearing until Bugio Light bears east; then steer for Bugio on this bearing until San Julian Light bears N.E., when an E.N.E. course will lead

* Rana Church, its apparent breadth open to the westward of Quinta Nova, clears the tail of the South Catchopo in 5 fathoms; and when exactly in a line, they clear the bank in 4 fathoms, about a cable's length from the depth of 2½ fathoms. These buildings are remarkable from their great comparative size, and cannot be mistaken for any others in the neighbourhood. —*J. Richards, Master of H.M. Ship Hecate*, 1851.

between the two lights. When Belem Light is seen, bring it to bear E. by S. as the vessel will be nearly in mid-channel, and may run up the river.

In entering from the southward, bring San Julian Light to bear N.E., and run on that bearing until Bugio Light bears east, and proceed as before directed. San Julian Light N.N.E. clears the South Catchopo in 4 fathoms, at a cable's length from the depth of 2½ fathoms.

When Cape Roca Light is shut in with Guia, a vessel will be pretty close to the shoals, and within the influence of the river tides; and therefore a cautious and constant reference to the bearings will be necessary. Should the ebb tide be running, be careful not to be set too near Bugio, and if in any doubt, haul more to the northward.

In order to receive the visits of the Health Office, you must bring-up off the castle of Belem, in from 17 to 14 fathoms; after which you will proceed to the anchorage, on the western side of the city and under the citadel. Here you must use good anchors and cables, mooring east and west, without buoys, on account of the tide; the bottom is mud, and the depth from 8 to 25 fathoms.

It is high water on the bar, at full and change, at 2h. 30m., with a rise of 16 feet. Variation 23° 30′ west.

From the bar of Lisbon the land runs southerly for 15 miles, having a low sandy beach reaching within 1 or 2 miles of Cape Espichel, where it becomes lofty; it then turns easterly toward Setubal, or St. Ubes. Cape Espichel rises perpendicularly out of the sea to a moderate height, its top appearing irregular, whitish on the north side, and reddish towards the south, with a chapel and lighthouse on the summit, the latter showing a fixed light. The lighthouse is elevated 627 feet above the sea, and is visible 12 miles off. To the eastward of the cape is Monte St. Louis, lying inland, and a little to the northward of it is a hill of less magnitude, shaped like a haycock; these when coming from the sea, are good objects to know the land by and may be seen before you can discern the cape itself, which lies in latitude 38° 24′ 9″ north, and longitude 9° 13′ 0″ west.

About 2½ leagues E. ½ S. from Cape Espichel, is Cape Ares, which is high land; a little to the westward of this are the small bay and town of Cezimbra: you will readily know this place by a castle built on the top of a hill; here, with winds from the N.W., north, and N.E., you may anchor, holding yourself in readiness to put off to sea, should the wind change. Near the land you have 7 and 8 fathoms; further out it becomes rocky so far as 30 fathoms: it is then clear; and here large vessels generally anchor, if necessary. From Cape Ares the land continues high and bold to the entrance of St. Ubes.*

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* Important to Owners of Vessels.—*Lisbon, April 11th*, 1839.—Art. 1st. All foreign ships entering the ports of this kingdom in ballast, and loading a full cargo of salt, shall be free from the tonnage duty. Foreign ships entering any of the ports of this kingdom, in ballast, and sailing out again, to take a full cargo of salt at another of our ports, are equally free from the tonnage duty.

Art. 2nd. All foreign vessels entering the ports of this kingdom under Franquia, in order to complete their cargoes with salt, shall pay the duty of 100 reis per ton.

Art. 3rd. All foreign vessels entering the ports of this kingdom to discharge the cargoes of merchandise, and here load a full cargo of salt, shall pay the duty of 100 reis per ton.

Art. 4th. All foreign vessels which, having paid the tonnage duly in one of the ports of this kingdom, sail in ballast to another port in the kingdom, in order there to take a full cargo of salt, are entitled to receive back the duty paid in the first port, with the deduction merely of 100 reis per ton, on presenting to the competent authorities a legal certificate of the said payment.

Art. 5th. The depositions of the Article 7th of the Royal Decree of 14th November, 1836,

SETUBAL, or St. UBES, is a bar harbour, situated 5 leagues to the eastward of Cape Espichel. On the west point of the entrance is a lighthouse, bearing a fixed light, elevated 490 feet above the sea, visible only 6 miles; and a little further in, the old tower of Outas, having two sentry boxes towards the sea.

On the east side of the entrance a *shoal*, extending more than a mile from the shore, makes the channel very narrow; the bar begins outwards more than ½ a league, and has there only 3½ fathoms over it; but the depths increase as you advance towards the tower of Outas; opposite which are 9 fathoms; and within the harbour there are 14 to 16, and in some parts 20 fathoms. As you enter the river, you will perceive three red-coloured precipices in a rocky cliff between Outas and St. Philip's Castle; bring these in one, and it will lead into the river: but the sands at the entrance are very liable to alter, and therefore a pilot must always be taken to conduct you safely in. The mariner should observe in sailing out of the river, to get under weigh at the turn of the tide.†

Nearly S.S.W. from the bar of St. Ubes, distant 10½ leagues, lies Cape Sines; the shore between is generally low, a projecting point, called Pesqueira, excepted. To the southward of this point are two small hills, with houses upon them, which serve to mark this part of the coast by: there is fair anchorage along the land, in from 10 to 15 fathoms, the ground clean. Cape Sines is low, but steep, having a *large rock* before it, and another to the S.W.; these are called the *Percebeiras Rocks*. Between these rocks and the island of Pessigueiro to the southward, is what is called the Road of Sines.

At 3 leagues from the island of Pessigueiro is the entrance to Villa Nova de Milfontes; the land between them is low, and the beach sandy, except at one spot, where there is a reddish-coloured precipice, which, with another lying W.S.W. of the bar, are objects to know this part of the coast by. Villa Nova has a *bar* at the entrance, over which are only 2 fathoms at low water, and from the southern point of the entrance a *sand* stretches out. Between Pessegueiro Island and Villa Nova small vessels may ride in 2 and 3 fathoms, under protection of a fort near the island.

About 2 leagues to the southward of Villa Nova is Cape Sardao, which is a point of high land; 5 leagues further is Arrifana, having a bay where vessels may ride in 8, 10, and 12 fathoms, under the guns of a fortress. At the entrance of the bay is a *rock*, resembling a ship under sail, surrounded with other small ones. About 6 leagues further is Cape St. Vincent.

CAPE ST. VINCENT is in latitude 37° 2′ 54″ north, and longitude 8° 59′ 30″ west. The cape itself is of moderate height, being nearly 80 feet, but to the northward the land is much higher, having many *rocks* about it. In coming from sea, and making for this part of the coast, you will first perceive the Monchique Mountains, which range along E. and W.; being divided into two parts, those to the westward are both larger and higher than those to the eastward; their summit, or uppermost point, bears from the Cape about E.N.E. ¼ E., and may be seen, in a clear day, full 25 leagues off, their computed height being 3830 feet above the level of the sea. Having obtained sight of these mountains, you will next perceive the elevated land to the northward of the cape, which will readily point out the situation of the cape itself. On it is a convent, and about 20 fathoms from its foot, a *rock*, large and high, there being a passage between it and the land, with a depth of from 10 to 15 fathoms, coarse sand and shells: outside this rock, a boat's length, are 11 and 16 fathoms, a ship's length 17 fathoms, and a cable's length 20 fathoms.

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relative to the payment of tonnage duty on Portugese vessels, are applicable to the Articles 2nd, 3rd, and 4th of the actual law.

Art. 6th. All former legislation, contrary to the present law, is hereby revoked.

† *St. Ubes, March 18th*, 1843.—The Board of Health, at Lisbon, has ordered that all vessels bringing clean bills from Portuguese Consuls, are to be admitted at once to pratique; so such are free from quarantine.

LIGHT ON CAPE ST. VINCENT.—A revolving light is established on the convent at the cape, the interval of each revolution being two minutes, in the course of which period a brilliant light appears for a short time, and is then succeeded by darkness. The lighthouse stands upon the western side of the cape; the light is elevated 221 feet above the level of the sea, and may be seen at the distance of 30 miles.

ROCK OFF CAPE ST. VINCENT.—In the year 1813, the Dædalus transport struck upon a *rock*, situated about 12 or 15 leagues S.W. from the cape, and received so much damage as rendered it necessary for her to put into Lisbon for repairs. Although the existence of this rock has been questioned by some, there is no doubt that it does exist, as several vessels have struck upon it, and some have been lost; but unfortunately its precise situation has not yet been determined.*

Nearly 3 miles S.S.E. from Cape St. Vincent is Point Sagres, hanging perpendicularly over the sea, and nearly as high as the cape itself; between these is the small bay of Boliche, quite open to the south-westward. At 1½ mile further is the south end of the broad point of the Baleira, not quite so high as the former point; between these lies the bay of Sagres, open to the south-eastward. On the north side of Baleira Point is a cove, partly sheltered by three high rocks, but open to the eastward. The two former bays afford good shelter in summer, with anchorage in from 14 to 16 fathoms; but Baleira Cove is only proper for small craft; neither of them is to be used in the winter, or with the wind to the eastward for then a heavy sea rolls in, and they are too much exposed in that quarter. The land is all well defended hereabout by batteries and forts. The shore to the eastward has some breaks and patches of low land about it, where barks sometimes take shelter, under the protection of the forts Figuera, Almadona, and De la Luz.

Rarril lies E. ¼ N., 13⅓ miles from Point Sagres, presenting a broad white headland sloping down to Point la Piedad. Point la Piedad is moderately high, appearing broken and ragged, with several *large rocks* before it; upon it stands a chapel, and on its south side a *shoal* runs out ⅓ a cable's length. This point may be considered the western boundary of the bay of Lagos.

The BAY of LAGOS is clean and capacious; in summer a number of vessels may anchor within it, sheltered from N.W. to N.E. winds, but exposed to all others. Less than a cable's length from Point Piedad are 9 fathoms water. With a man-of-war the best riding will be in 18 fathoms, east from Point Piedad, distant a mile; a frigate may lie closer, in 15 fathoms; the small vessels in 8 fathoms, right before the town, in latitude 37° 8′ 40″. The northern shore of the bay is low and sandy, but the land within

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* The following account of this rock is given by Mr. John Aves, master of the schooner *Tantivy*, of Plymouth.—Dated Plymouth, March 23rd, 1849:—

"There is a *rock* off Cape St. Vincent, named *Dædalus*, marked doubtful on the chart, on which I have heard some ships have struck, and that some masters of vessels have seen it, but I believe it is some time since. However, on my passage this time from Zante, on the 6th inst., at 9h. 30m. P.M., I went close to the eastward of it—indeed much closer than I wished; and as we did not see it till close aboard, it was with difficulty avoided. There was a swell from the N.W. at the time breaking over it, and a sheet of foam around, about 20 to 25 fathoms in circumference. The top of the rock might not be large, but no doubt can remain that a rock is there; and it is much to be regretted, that the true position of such a dangerous one has not been ascertained. We stood N.N.E., on the port tack, till 7 next morning, when we tacked to the southward, the cape close on board, distant about 2 miles. In my opinion the rock is laid much too far to the westward in the chart, and I should say that it bears about S.S W. (true south), distant about 37 or 40 miles from the cape. This might be a caution to some of my brother mariners navigating round the said cape not to stand too far off."—*Shipping Gazette.*

Three rocks are reported to have been seen by A. Coverdale, Master of the brig *Edward* and *Sarah*, (from Faro) in January, 1855, at 9h. 10m. P.M., a fine, cloudless, starlight night. The brig passed between the rocks, the northern one being 90 or 100 feet from the others, all plainly seen, as the brig passed within 5 feet of the northernmost rock. The supposed position of these rocks was S.W. by S., about 40 or 45 miles from Cape St. Vincent.

rises up to a moderate height, having upon it the villages of Alvor and Amixelhoeira, and the river of Alvor. The river of Lagos is navigable, but requires a pilot to conduct you in; near its mouth the bottom is rocky, and continues so until you get into 18 fathoms.

At 7 miles east from Point Piedad lies Point Irmaos, or De los Hermanos (the Three Brothers), formed by three small rocks, of middling height, but not projecting into the sea; this may be considered as the termination of the bay of Lagos.

VILLA NUEVA RIVER lies 10 miles from Point Piedad, and can only be taken at ⅔ flood. There is a fortress on each side of the entrance, but you must have a pilot. The lowest water on the bar is 8 feet; but within it becomes deeper, and is navigable northward so far as the town of Silves, 6 miles from the entrance.

INSTRUCTIONS for ships intending to run into the harbour of Villa Nova di Portimao. Signals made at the fort of Ferragude, east of the bay:—

1. A red flag, with a broad pendant under the same, indicates that ships are to choose a proper place where to take a pilot on board.

2. A broad pendant, with a red flag under the same, signifies that no pilot can be sent on board.

3. The Portuguese flag, with a red one under the same, is a signal that ships must immediately return to sea again.

4. The red flag by itself, signifies that a ship may approach the bay to take a pilot on board.

5. If it should so happen, that on account of stormy weather pilots could not venture to leave the bay, and ships are forced to enter the same without one, signals will be made with the red flag from the fort.

"Lagos and Villa Nueva," says Captain Smyth, R.N., "in time of war with Spain, are of the utmost importance, more particularly if Cadiz is blockaded, as vessels will be dispatched there for water; on which occasion it will be necessary to observe the following instructions:—At half-flood the boats can get near enough to land the casks, and may be taken off as late as a quarter ebb. The tide ebbs and flows in Lagos River at 2 o'clock, full and change; it rises about 13½ feet with the spring-tides, and 9 with the neaps. The bar is just covered at low water; when high it will have 14 feet on it with spring-tides, and 10 with neaps. In fine weather about 180 tons of water may be rafted in 24 hours. Refreshments, such as poultry, pigs, rabbits, pigeons, fruit, vegetables, &c., may be procured on reasonable terms.

"In Villa Nueva River, water may be got in transports at about 150 butts in 24 hours; these must be rafted 3 or 4 miles down the river with the ebb-tide, the water being too shoal for ships to go nearer to the fountain where it is procured. There is a depth of 16 or 18 feet water on the bar; but, in my opinion, it is only a summer watering-place; for the Portuguese told me, that in winter the bar is seldom passable for ships, as the breakers are very dangerous, and the swell is a long way outside it. At the lower watering-place a butt may be filled in 8 minutes, and at the upper one in 7 minutes."

At 5 miles from Villa Nueva, and 15 miles E.S.E. from Point Piedad, is Cape Carvoeira, moderately high, with the fort of Encarnacao on it, which serves for the defence of two small bays lying on each side of the cape. At 2¼ miles further east is another fort, La Rocha, built upon a blue point which projects into the sea, having also a small bay on each side of it, affording shelter in winds from the N.E. and N.W.

Nearly E.S.E., 7 miles from Cape Carvoeira is the point of Albofeira, on the east side of which is a small bay, the town being at the further end, built upon a height, near the shore, enclosed with walls and ancient towers. On the beach is a battery. Small vessels may here find shelter from winds in the N.W. to the N.E. quarters, the anchorage being good.

S.E., 12½ miles from Point Albofeira, is the city of Faro, the coast forming a circular bight; midway stands the town of St. Antonio de la Quarteyra, built on a rising ground, with a river and fort adjacent.

The CITY of FARO is situated near the shore, at the entrance of the bar to that channel which divides the islands that constitute Cape Sta. Maria from the main; over this bar (called the little bar) the depth at high water is only 10 feet. The channel leans to the eastward, passing St. Anthony's Chapel and the town of Huillon, thence bending a little northerly towards the great bar; here there are 13 feet at high water, and by this passage vessels generally enter. There is also another channel between the eastern and two western islands; this is called the new bar, and has but 9 feet over it: from the shallowness of the water, none but small vessels can navigate these passages. Fort St. Lorenzo protects the entrance of the new bar. The middle island properly forms the Cape Sta. Maria, which is low and sandy, with 2 and 2½ fathoms a cable's length from the shore; 3 cables' length off are 3 fathoms; 5 cables' length off are 5 and 6 fathoms; a mile off are 9 and 10 fathoms; the depth thence increases rapidly, so that a league from the cape are 80 and 90 fathoms; and a little further no ground at 150 fathoms. The bottom is generally sandy, with some small shells intermixed.

LIGHT on CAPE STA. MARIA.—This new lighthouse being completed, it was first lighted on the 24th of June, 1851. It is a *fixed light*; and the lantern being 109 feet above high water, it will be visible at the distance of 15 miles from the deck of a vessel 10 feet above water.

In making for Cape Sta. Maria, you will observe an inland mountain, called Monte or Mont Figo, which is visible 16 leagues off, and not like any other about this part; it bears N.E. from the cape. When seen from the westward or eastward, it then appears by itself, and not attached to the northern range of hills; but when viewed from the southward, these hills appear grouped and blended together. Mont Figo is about 2000 feet above the level of the sea, and from the poop of a ship-of-war will be visible in latitude 36° 15′, or 18 leagues off, but in coming from the westward you will not discover it until you have passed Sagres; and it cannot be perceived at the distance of Cape St. Vincent. There is a little hill to the eastward of Mont Figo, which somewhat resembles it in shape, called the Little Mountain.

To the eastward of Cape Sta. Maria is the small barred entrance of Foseta; and 18 miles E.N.E. ¾ E. from the cape, is Tavira, fit only for small vessels and coasters, and then only to be entered with a pilot: but before the latter place you may anchor in 4 or 5 fathoms, having the wind off-shore. The whole coast from the Great Bar of Faro to Tavira is encumbered with sandy islands, separated from the main by narrow channels and salt-ponds, navigable by boats; ridges of high land appear up the country from Mont Figo to Mont Gordo; the latter being a remarkable object, and visible still further off than Mont Figo. About 4 leagues from Tavira is the entrance to the River Guadiana, which divides Portugal from Spain.

The RIVER GUADIANA is bounded on the west side by Point St. Antonio, which is low and sandy, having a *reef* or *bank* extending from it nearly south, above a mile; and on the east side by Point Canelas, from which also a similar *sand* runs out about 2 miles; between these banks the channel, or bar, is about a cable's length in breadth. On the western side, about a mile from Point St. Antonio, is the town of Villa Real, and 2 miles further, on the same side, Castro Marin; but between these places a branch of the river runs to the westward. At two miles up the River Guadiana, on the opposite or eastern side, stands the Spanish town of Ayamonte. Two channels separate to the eastward before you reach the town, leading to Higuereta and Tuta; these are nearly dry at low water; but when the tide gets up, there is sufficient for coasting vessels.

To sail over the bar of Ayamonte or Guadiana, you should bring the Church of Cazerla on with a small hummock near the mountain of Mont Gordo, or the Blue Hill; follow that direction in, until two white mills on the east side of the river come in one, bearing N. ¾ W.; run along mid-channel until you are abreast of Villa Real; then, if a large ship, you must anchor, but small vessels go higher up. At low water spring-tides, this bar has no more than 9 feet over it; but within the bar will be found 3 fathoms. On full and change days it is high water at 3 hours, and the tide rises about 12 feet.

THE COAST OF SPAIN.*

FROM THE RIVER GUADIANA TO GIBRALTAR.

Vessels leaving Ayamonte Bar for the eastward, will pass Point Lar Majorra and the tower of Canelas. Give the shore a berth, for *small reefs* run out from the several points of the channels between the islands; your soundings otherwise will be regular toward the shore.

At 3 miles eastward from the tower of Canelas are the bar and entrance to the town of Higuereta, to enter which, you should bring the Point Cayman on with the church; keeping it in that direction until you get within the shoals; then steer in mid-channel for the town: you will there have 3 fathoms, while on the bar are only 3 feet. Tuta Bar is quite dry, and fit only for barks employed in the tunny fishery, for the convenience of which there are some huts erected on the shore. E. by S. from Tuta, distant 3 miles, is an opening made by the sea at Terron, the entrance to which is towards the south; but it is at present very narrow, and at low water has not more than 3 and 4 feet on it: you will hereabout observe a reddish-coloured land, running from Tuta eastward to Catalan Tower, of an elevated but rugged appearance. The tower of Terron is built low, and scarcely to be distinguished as you pass along. Further on, you will reach the bar of Marigato, over which are only 3 feet at low water, though within are 4 and 5 fathoms. In entering, keep nearer to the sandy island than the eastern point, and the broken water will point out the channel, within which you lie sheltered from all winds.

About 2 leagues from Marigato is the entrance to Huelva and Palos. At its western point stands the tower of Umbrio. From this point a *reef* runs out a full mile to the southward; opposite the point begins another *bank*, which runs nearly parallel to the coast 6½ miles, leaving a channel between; there is also another *little bank*, stretching from Piacho Point to the southward 1½ mile. Here is the bar of Rodrigo; between which and the bank just mentioned, is the Choza, or channel into the harbour. But all these entrances can only be taken at high water, and require a pilot.

Odiel River Lights.—Two lights are established on the *bar* at the entrance to Huelva and Palos; they are both *fixed* lights, one on a pillar and one moveable, and the two in one lead over the *bar*.

About 3 leagues from the entrance of Palos is Oro Tower, generally surrounded by the water. Les Arenas Gordas, or the Sandy Downs, begin here about midway between the point and tower. At 3 miles from Oro is Asperillos Tower, built on the summit of some sandy cliffs, and 4 leagues beyond that is Higuera Tower: here is the highest part of these sand hills. At 4 miles from Higuera Tower stands Carbonera Tower, on the top of the sand hills, which become less elevated, and broken into small hummocks; some houses stand hereabout, where if necessary, provisions may be obtained. Two other towers will be passed before you reach the entrance of the River Guadalquiver.

* Light Dues in Spain.—By official accounts received at Lloyds, it appears a royal orde has been published in the *Madrid Gazette*, to the effect that in future foreign vessels discharging in a port in Spain, may load there, or at any other Spanish port, without being subjected to the payment of more than one charge for lighthouse dues.—*Nautical Magazine*, December, 1850.

ST. LUCAR.—The course from Cape St. Vincent to the entrance of the Guadalquiver is E.S.E. ½ S., and the distance nearly 40½ leagues; and from the Guadiana to the Guadalquiver S.E. ½ S., distance 16 leagues; between the two latter there is not a port for shipping which can be safely entered without a pilot. Every river has its bar of sand, and the shores are generally low and sandy.

On the northern side of the Guadalquiver stands the Castle of Jacinto, appearing among the sand-hills, about 3 cables' length from the shore. From this point runs a *dangerous rocky shelf*, about a mile west; in some parts it dries, and over others it has 6 feet water. At 1½ mile W. by S. from Jacinto Tower is a *rocky shoal*, of considerable extent, named *Juan Pul*, with 7 feet water over it, which forms the narrowest part of the entrance of the bar of St. Lucar; and W. ½ S. from Jacinto Tower, about 2 miles, is the *shoal* of *Pavona;* ½ a mile from which, in the same direction, is the *Pichaco*, being dry at low water.

Nearly S.W. by W. from Point Jacinto, distant 4 miles, is Point Chipiona, on the southern point of the Guadalquiver, low and flat, having a *reef* running out N.W. from it, about a mile, called *El Perro*, or the *Dog:* several fishing crawls are to the northward of this point.

CHIPIONA LIGHT.—This is a *fixed light*, shown from the Church Tower of the town of Chipiona, the south point of the entrance of the River Guadalquiver. It is elevated 70 feet, and is visible 8 miles; bearing from the N.W. part of *Salmedina Shoal*, E. by S. ½ S., distant 1$\frac{8}{10}$ mile.

W.N.W. of Chipiona, about 2 miles, lies the north end of the *Salmedina Shoal*, extending about a mile N. by W. and S. by E.; at low water this bank is visible, but at other times the sea breaks over it; on its western side are 5 fathoms; there are some small channels within it, but fit only for fishing craft. At ½ a league to the eastward of Chipiona is Point Montigos, low and rocky, with a *reef* to the northward running out about a mile; a little way from its outer end is the *Galonera Shoal*. From Point Montigos, distant 1½ mile, stands the castle of Espirito Santo, moderately high, and in two places sinking down, terminating in a flat towards the sea; the whole has a reddish appearance, and is covered with pines at the top; between these points the coast forms a kind of bay.

From Point Espirito Santo a *reef of rocks* runs out full ⅜ of a mile, called the *Mole*, and N. ¼ W. from the point is a *larger reef*, named *El Banquete;* from the extremes of these reefs runs the edge of the south shoal of St. Lucar, uniting with the Galonera and Montigos Reefs. E. by N., nearly 3 miles from Point Spirito Santo, lies the western part of the little harbour of St. Bonanza; and ½ a mile from the point is the town of St. Lucar.

From this description of the *shoals* that surround the entrance of the Guadalquiver, it will be seen that the *Pavona Juan Pul*, and *Cape Shoals* are on the north or port side, and the others on the southern side of the river.

Directions for Port San Lucar, from Nautical Magazine, July 1854, p. 395.

Official information has been received that the Spanish Government, on the 21st of January, 1854, established the following lights at the Port of San Lucar-de-Barrameda.

"1. A *fixed light* on Malandar Point, on the north shore of the port, at an elevation of 36 feet above the sea, and visible at the distance of 6 miles.

"2. A *fixed light* in a high building at the northern end of the village of Bonanza, in the interior of the port, on its eastern shore, at an elevation of 53 feet above the sea, and visible at the distance of 8 miles.

"3. A *red light* in an elevated position to the southward of the Castle of Espirito Santo, the point of which forms the southern limit of the port.

"In order to enter this port, the wind being free, a vessel having passed to the westward of *Salmedina Shoal*, should steer N.E. ¼ E. for 2¾ miles, when she will be in about 5½ fathoms water, sand, and will have the two lights above mentioned of

Malandar and Bonanza nearly in one; the bearings of these lights should be taken correctly, and the course altered for them to east. Having run 1¼ mile on this course, the *red* light on the southern shore will be seen bearing S.E. ½ E., and when so far advanced as to bring it to bear S.S.W., the vessel will be in the narrowest part of the channel, (which is not 2 cables' across), and this *red* light will be eclipsed; on which taking place, an E.S.E. ½ E. course is immediately to be steered, until Malandar Light bears N.W. ½ N., and Bonanza Light E.N.E., when she will be in 6 to 8 fathoms water, on sand; she may then steer N.E. ½ E. for Bonanza Road, and when that light bears S.E. ¼ E. anchor in 4 to 6 fathoms water, on sandy bottom.

"The many *rocks* and *shoals*, both inside and outside of this port, render it difficult and dangerous to enter with a beating wind without a pilot, and no vessel should attempt it at night, but keep to sea until daylight, or anchor to the N.N.E. of Chipiona, if the weather should permit.

"It is high water, full and change, at Chipiona at 1h. 34m., and at Bonanza at 2h. 0m., and the greatest spring tide range is 12½ feet. The above bearings are magnetic."

To enter the River Guadalquiver, you must bring the convent of St. Geronimo on with the four peaked hills of Gibalbin: these are very remarkable, and cannot be mistaken; on whichever peak you bring the convent, it will lead to the channel. Continue in that direction until the castle of Espirito Santo bears south; then, if in 3¾ or 4¼ fathoms, stand S.E., but if in less water, E.S.E., a little easterly, so as to approach the shore between Jacinto Tower and Point Malandar, which runs close under, till you are about S.S.W. from that point; then stand over towards the harbour of Bonanza, and anchor in 6 or 7 fathoms, sand and oaze, mooring according to the direction of the current, and taking due care to avoid the *small bank* lying E.S.E. from Point Malandar.

The passages between the *shoals* at the entrance of the river are fit only for small vessels; but near their outside will be found 5 and 6 fathoms, deepening as you go to seaward.

It should here be observed, that with scanty or contrary winds, no vessel drawing above 14 feet should attempt to enter, it being too narrow for any but coasters; and the mariner must beware of the fishing-nets spread within the river, or they will entangle, and render his vessel ungovernable. Vessels frequently ascend the river almost as far as Seville; but this cannot be done by a stranger, or without the assistance of a pilot. The city of Seville is the capital of the province, and was formerly a place of great consequence; but from the difficulty of vessels navigating the River Guadalquiver, the trade has principally been removed to Cadiz. As it now is, ships are obliged to load and unload their cargoes 8 miles below the town. The commerce consists of wool, skins, oil, silk, and fruits; and their imports are the various manufactures of England, colonial produce from America, iron from Bilboa, &c.

Passing Chipiona, you will meet with the Corrales of Regla; give the shore a good berth, for the bottom is covered with *stones* and *rocks* all the way to the westward. Here, at the end of a flat beach, you will see the Convent of N. S. de Regla, and further on, the tower and high land of Beva. At 6 miles from Corrales de Regla is Point Candor, small, flat, and with a *reef* running from it all the way to Rota, which is 1½ mile from Point Candor, and at the entrance of the Bay of Cadiz; is has a pier near the point for small coasters, which can only go in at high water.

CADIZ.—This is a place of great antiquity, having been originally colonized by the Phœnicians, who are said to have named it Gadir, or according to D'Anville, by the Tyrians; the title of Gadir having, by the Romans, been changed to Gades, and since that to Cadiz, the name now universally adopted. It is the first commercial city in Spain. The convenience and excellence of its harbour must always ensure to it a great trade. It is situated at the extremity of a low, long tongue of land which projects from the Isle of Leon. The city is surrounded on its south, west, and north sides by the sea, and communicates, on the eastward, with the land, by means of a narrow road

which runs along the isthmus. When the city and its environs are viewed from the harbour, the appearance is exceedingly handsome.

The bay of Cadiz is a vast basin, enclosed on all sides except the west, and the wind from that quarter frequently sends in a swell, which occasions the ships to roll very heavily when at anchor; with this exception, it forms one of the finest bays in the world, with excellent anchorage, and well protected from the inclemency of the weather, by the adjacent mountains. It is defended by four fortresses, called St. Sebastian, Sta. Catherine, or Catalina, St. Louis, and Puntales; these two last protect the grand arsenal La Caraccas, in which are three basins and twelve docks, well supplied with every article of naval stores. This is situated within the inner road, distant about 2 leagues from the city.

The town of San Fernando lies on the east side of the Isle of Leon, and is distant from Cadiz about 6 miles; near it the town of St. Carlos is erected, being the residence of the Captain-general, and the Intendant of the Marines, the site of the treasury, and other public buildings. The Isle of Leon is separated from the main land by the Rio de Sancti Petri, or River St. Pedro, which is 3 leagues in length, and 3 and 4 fathoms deep. There is a bridge at the eastern part of San Fernando, which leads from the main land to Cadiz.

The town of Puerto de Santa Maria lies to the north-eastward of Cadiz, from which it is distant nearly 5 miles; it is situated upon the banks of the River Guadelete, which runs past it, and is navigable, but it has a *bar* of only a foot at low water; nevertheless, the town is well built, and has a large population. It is from this place the city of Cadiz is supplied with fresh water, by vessels constructed, and constantly employed for this purpose.

Puerto Real is situated in the inner harbour. The channel of Trocadero, which runs from Puerto Real towards Forts St. Louis and Matagorda, has a dock for unrigging, cleaning, and repairing vessels-of-war, and also merchant-ships. The channel is only 34 yards in breadth, measured from the depth of 5 feet on one side to 5 feet on the other. Vessels going in or out, must wait for the full tide; for, at the mouth, the depth at low water is only 7 feet, increasing inwards to 9, 10, and 12 feet.

The tower or lighthouse of St. Sebastian, which is in latitude 36° 31′ 53″ north, and longitude 6° 18′ 30″ west, has on it an excellent light, which was altered in June, 1855, from a *revolving*, to a light varied by *red* flashes every 2 minutes, and visible 20 miles, being a most conspicuous and useful object in making for the harbour. But the mariner must be cautious, and not mistake the tower of Hercules, or Torre Gorda, for the tower of St. Sebastian, especially in hazy weather, as such an error might be attended with fatal consequences. The former stands on the top of a little sand-hill, 5½ miles S. by E. ¼ E. from the latter, being a round building, with a battery at its base. It may also be proper to observe, that there is another tower, called Casa de Beva, which lies N. ¾ E. from the lighthouse of St. Sebastian, distant about 4 leagues; this stands on a lofty ridge of hills, and may be seen at a great distance; it is of a square form, and has a round cupola at the top, being situated between two large houses. From Rota to this tower the bearing is N. by E. ¼ E., and distance 2 leagues.

Rocks and Shoals in the vicinity of Cadiz.—These are laid down in the particular chart of the harbour by Tofino; nevertheless, a reference to, and a description of, their respective situations, may prove useful. About ⅓ of a mile N.W. ½ W. from the lighthouse of St. Sebastian, is the *Olla*, or *Pot Rock*, over which are only 6 feet water. The *Cochinos*, or *Pigs*, are *two small black rocks*, visible at low water, but covered before full tide; these lie with the above lighthouse bearing S. ½ W., distant ¾ of a mile, having the two towers of a most remarkable church in a line; this is the Carmelite Church, situated on the Alameda, or public walk, at the N.W. part of Cadiz.

The *Puercas*, are a *cluster of black rocks*, extending E. by S. and W. by N. They are visible at low water, and at the full of the tide so near the surface, that the sea always breaks over them. The bearings and distance of these from the Cochinos, are

E. ¾ N., nearly a mile. The *Freidera* is a *shoal* always under water: over it is seldom less than 1½ fathom; but whenever the sea becomes agitated, or any swell rises, the sea breaks over it. The mark for this shoal is the Carmelite Church, before mentioned, S.E. ½ S. *La Cruz* is a rock always above water; it is the largest of a number which lie close to the wall at the foot of the bastion of the Bonnete, or westernmost bastion of Cadiz. *El Frayle*, or the *Friar*, is a *rocky shoal* lying off the N.W. bastion of the town, behind which may be seen the convent and church of Carmelite. Its bearing and distance from the Puercas are S.E. by E., 435 fathoms. The least water over this danger is 3 feet. From the east end of the shoal the Carmelite Church is seen between the two sentry boxes on the bastions called Candelaria; from the west end, the rock La Cruz will be in a line with St. Sebastian's lighthouse.

El Diamante, or the *Diamond*, is a *rocky shoal*, extending N.W. and S.E., about 165 fathoms. The least water over it is 10 feet, increasing to 22 feet at the distance of 100 fathoms, and thence to 30 feet. From its shallowest part the flagstaff of the castle of Sta. Catalina del Puerto appears to be in a line with the Morro, or hill of Xeres, bearing E. ½ N.; and the northernmost part of the town of Puerto Real bearing S.E. on the southern little hill of Medina, a town situated on the top of a hill up in the country, the Puercas, at the same time, appearing in a line with the fort or castle of Sta. Catalina, on the N.W. side of the city of Cadiz. The Morro of Xeres stands far inland, and is the south-eastern extreme of a range of hills, even at their summits, but there sinking down suddenly, forming like a step of a stair, and beneath which the land on the south continues much lower.

La Galera is another *rocky shoal*, extending from north to south nearly 400 fathoms, and lies at the distance of 412 fathoms to the westward of the Diamond. On its shoalest part are 9 feet of water; here the southernmost part of Puerto Real appears in a line with the first top of Barruco, a remarkable little double-topped hill, situated up the country, and seen over the bottom of the bay; and the steeple of St. Domingo S.S.W., a boat's length within the point of St. Philip, the same point being then in a line with the ditch of the land-port of Cadiz. The steeple of St. Domingo is to the south-westward of the mole of Cadiz, or between it and the ramparts of the land-port. The point of St. Philip stretches from the N.E. part of the town, and between the mole and the Carmelite Church.

Los Corrales, or *Coral Shoals*.—These extend 730 fathoms from the ditch of the land-port of Cadiz to the south-eastward; the depth of water along the outer edge, beginning at the fortifications, is from 4 to 10 feet; the bottom is of rock, with patches of mud. Between Corrales and the point of the castle of Puntales, is the *shoal bank of St. Domingo*, on which the least depth is 8 feet, the bottom being shells and sand. The outer edge of this shoal and the opposite shore of Matagorda form the narrowest part of the channel; it lies in a direction with the castle of Puntales and the Torro Gorda in a line, which will always prove a useful mark for those going to anchorage in the bay.

The HARBOUR of CADIZ.—The entrance to this harbour is between the town of Rota and city of Cadiz. Vessels coming from the westward will, as they approach Cadiz, observe inland a ridge of the Sierra Ronda, having one hill among them higher and rounder than the rest; this is called the Moor's Head, and should be brought to bear E. ¾ S., which course will carry you direct for Cadiz. Pilots are always in readiness to conduct either men-of-war or merchant-ships into the harbour.

Cadiz New Observatory is in latitude 36° 27′ 45″ north, and longitude 6° 12′ west: it is distant from Cape St. Vincent about 44, and from Cape Sta. Maria 25 leagues. You will discover the steeples of the churches of Cadiz 8 or 10 miles off, in clear weather, appearing somewhat like the masts of vessels; and you will also see the tower of St. Sebastian, upon which the light is exhibited, which with the soundings, will readily inform the mariner of his approach.

To enter the harbour of Cadiz, coming from seaward, with an adverse easterly, or

south-easterly wind, you must give the point of St. Sebastian a good berth, as before directed, to avoid the *Olla Rock*; then bringing the castle of Sta. Catalina del Puerto in a line with the road leading to Xeres, or on with a break in the N.W. part of Xeres Hill, you will proceed in that direction until the two steeples of the Carmelite Convent come open of one another; then you will be beyond the Cochinos. Haul up, and stand towards the shore, provided the castle of Sta. Catalina be open of the hill of Xeres; but with a ship of great draught, stand not so far as to bring Puerto Real open of Medina, but put about to the southward, to avoid the Diamond; this caution may not be requisite with a small vessel, which may keep on toward the north shore, if well assured of making good way on your port tack, so that the Puercas may not come in one with the tower of St. Sebastian before Puerto Real is well on with Medina, for this latter mark will lead you on the Diamond.

If standing on the port tack, before you are clear of the Cochinos, take care not to get the two Carmelite Towers in one when the tower of St. Sebastian bears S.S.W.; but so soon as you shut the opening between the two towers, put about, bringing the break before mentioned, and Puerto Real Church, in a line; then you will, next board, go between the Diamond and the Puercas, taking care not to bring Medina open of Puerto Real until the steeple of St. Francis, in Port Sta. Maria, appears on the east side of the castle of Sta Catalina; then continue on to the northward, for you will have passed the Diamond: but when standing to the southward again, you should not separate Puerto Real from Medina, until St. Domingo steeple comes open of Point St. Philip; you will then have weathered the Frayles, or Friar's Shoal and may stand on until the steeple of Puerto Real, is a little to the northward of Medina, when you will find yourself within all the shoals, and may choose your anchorage in from 4 to 6½ fathoms.

Vessels sailing into Cadiz Harbour with a fair and leading wind, may, as soon as they are in the fairway, and have brought the churches of Puerto Real and Medina in one, bearing S.E. ½ E., steer on in that direction until they perceive the mole of the Seville Gate at Cadiz, open to the east of the Point St. Philip, which is the eastern point of Cadiz; then haul round, and anchor in 5 or 6 fathoms, with the castle of Sta. Catalina, bearing N.N.E., or in 3½ or 4 fathoms, with the head of the mole bearing west; but if wishing to run beyond Cadiz, steer right for the old castle of Matagorda until you see the tower of Hercules, called Torre Gorda, open of the east side of the fort of Puntales; then lay the ship's head towards Torre Gorda, until you bring the southern part of Matagorda Fort on the northern part of Fort Louis, whence you may stand on for the high tower on Leon Island, or between it and the adjoining Carmelite Convent, and anchor, with the tower bearing about S. by W. ½ W.

Vessels of small draught of water, with a fair wind and good weather, may go between the Cochino, Puercas, Freidera, Friar, &c., and the shore of Cadiz. This channel has from 15 to 24 feet water, and begins at the Rock de la Cruz; but this passage is too hazardous to be attempted without a pilot.

There is also a channel round the northern shore, in which case the vessel must round the point of Rota, which is *rocky*, and should have a good berth. Off the town of Rota is a small pier, fit only for coasters at high water. At 1¼ mile from this is the Gallina Battery; further on, the River Salado; the coast then bending to the S.E., forms Point Puntilla; nearly 3 miles further are the point and castle of Sta. Catalina; the shore then winds round to the north-eastward, where, at the distance of 2 miles, stands the town or Port of Sta. Maria.

Large ships entering the harbour this way, should keep well under the land to the northward of the castle of Sta. Catalina, at the distance of ½ a mile, until that castle comes upon the hill of Xeres, bearing E. ¼ N.; you will then be within all the shoals, and may stand on for Cadiz, anchoring as most convenient. The common direction for the anchorage is with the castle of Sta. Catalina about N.N.E., in 6 or 7 fathoms; but small vessels generally ride nearer the city, and in less water. There are several ships-of-war sunk between Rota Point and the anchorage; care, therefore, should be taken not to run foul of the wrecks.

REMARKS ON ENTERING CADIZ.—*Extracts from the Nautical Magazine, Dec.*, 1840. —In going into Cadiz in the night, great care is necessary, as no pilot will be obtained; the north shore being light-reddish coloured cliffs, and Cadiz itself showing quite black, creates a deception of vision; the lead is no guide, and a great chance is, that a stranger, when he fancies himself in mid-channel, will be well over on the Cadiz side: therefore, the safe way is to borrow over to Rota, which town will be readily seen on any night that a vessel should attempt going in. Bring it in such a position as will enable you to pass it, at from 1½ to 2 miles, steering E.S.E.; observe when the light bears south, (the light is south, a little westerly, about 5½ miles from Rota,) right a-head will then be the castle of Catalina, which will be seen at the termination of the light-coloured cliffs. If you are in mid-channel, this castle will be about a point on the port bow, the ship's head E.S.E., and you should not be further to the south then you have it in this last position, which, if you are in, continue your course; if more to the north, and it appears right a-head, steer S.E. by E. for about 1½ mile, which will bring the light to bear S.W. by S., then you will almost certainly see the men-of-war at anchor, and may steer for the outermost, or S.S.E., if you should not see them, which course, in about 2 miles, will shut in the light; and the usual anchorage off the town for small vessels, will be S.W., about a mile.

This proceeding will, however, take you right over the Diamond, and is, therefore, only fit for vessels not drawing 12 feet, and smooth water, the state of tide considered; but it will effectually clear you of the more northerly shoal, the Galera, on which there is much less water. The Diamond may, however, be avoided by a course a point more south, if you are sure of your position when the light bears south. Such a course will carry you towards the Puercas, which will, however, be seen on a clear night, except during very high tides, and perfectly smooth water, (in which circumstances you may pass over the Diamond). If obliged to run in during a heavy west gale steer for the Puercas immediately you see them (always supposing you have obtained the right position between Rota and the lighthouse); the sea, in such weather, will be seen breaking heavily on all the dangers in the bay. The channel between the Puercas and Diamond is more than a mile wide. Perhaps, for a perfect stranger to enter during the night, a more safe course is to steer along the north shore, right up to the castle of Catalina; when the light bears W.S.W., you are clear within all the dangers, and can steer down to the anchorage about S.S.W. In heavy gales from the west or S.W. no one should go in during night, if possible to keep out, not even those the best acquainted; for in such weather, even if moonlight, you cannot depend upon it being clear for 5 minutes.

It is high water in Cadiz Bay at 1h. 45m., full and change, and the springs rise 9½ feet. In the space between the Frayle and Cochinos, the ebb runs strongly through the channels between the shoals, and the flood sets towards them. This, therefore, should be particularly attended to by vessels entering or tacking hereabout.

From CADIZ to TRAFALGAR the shore runs southerly, having many *rocks* which lie scattered about, and are *extremely dangerous*; therefore, in sailing round the Isle of Leon, you must give the land a good berth, and keep the lighthouse of St. Sebastian wide open to the eastward of the town of Rota: or bring the lantern to bear N.N.E. easterly, by which you will clear the rocks which lie about S. ¾ E. from it, distant a mile. Further on, 2½ miles from the lighthouse, is a *rocky shoal*, with only 13 feet over it at low water; to clear this it will be proper to keep the lantern a point or two to the eastward of N.N.E.; but the beach here is so low, and the rocks so numerous, that seamen should ever be cautious of approaching it too near.

The River St. Pedro, which divides the island of St. Leon from the main, is unfit for any but small craft. At the entrance of this river is the islet Sancti Petri, surrounded by *rocks*, and having on it a castle with a square tower, lying nearly south, 5¼ miles from the Torre Gorda. Rocky banks and dangers continue to line the coast so far as Cape Trafalgar; keep, therefore, at a good distance from the land, and you will clear them all. At a little distance from San Pedro's River stands Torre Bermeja, or the Red Tower; 1¾ mile further is the tower of Barrosa, standing on an eminence; a short way from this is a hill, called La Cabeza del Puerco, or the Pig's Head, which

serves to point out the position of several *shoals* hereabout. At 2⅓ miles from the tower of Barrosa is Cape Roche, having a square tower upon it: this cape is of a reddish colour, by which it may readily be known.

N.W. ½ W. from Cape Roche, distant 5¼ miles, lies the outer *rocky shoal of Haste*, with 3 fathoms over it; this must be carefully avoided, as there are from 10 to 14 fathoms near it; the sea rolls heavily over it, and sometimes breaks. A little more than 3½ miles N.W. of Cape Roche, is the *Marajotes Shoal*, with only 1¾ fathom over it; and W. by N., a mile from the tower of Cape Roche, is a *shoal* with 2 fathoms over it.

Conil Tower stands on rising ground, somewhat higher than Cape Roche; here is a small river, admitting coasting vessels, which lie dry at low water. Further on is Castilobo, a square tower; 5 miles from thence is Cape Trafalgar; S.W. by W. ½ W., distant 2 miles from Castilobo Tower, lies the *Shoal of Conil*, having 1¾ fathom over it. There are passages between all these shoals and the land, with 7 or 8 fathoms water; but without a perfect knowledge of the coast, the mariner should go to the westward of them, where, at the distance of 1½ league from the land, he may safely run along in deep water, and without any danger.

CAPE TRAFALGAR lies in latitude 36° 10′ 15″ north, and in longitude 6° 1′ 30″ west. It is about 25 miles distant from the lighthouse of Cadiz, and is of moderate elevation; it may readily be distinguished by its singular appearance, being flat, and terminating with two sharp angles; on the eastern one stands a round tower. To the eastward of the flat land it becomes high and mountainous: here you will observe several high sandy cliffs, while to the northward of the cape it is level and sandy, having only a few low rocky points projecting out to seaward.

ALTOS, or HEIGHTS of MECA.—To the north-eastward of Cape Trafalgar the land rises high in the interior, and forms the heights of Meca, the summits of which appear level, and are divided into two parts, being spotted with green clumps and patches of whitish sand.

The tower of Meca lies 3½ miles S.E. by E. ½ E. from Cape Trafalgar; and between them is a *patch of sand*, called the *Boqueron*, used as a mark for the shoals in the offing. It is not advisable for vessels to come too near the cape, on account of the many rocky shoals that environ it.

The ACEYTERA is a *dangerous reef of rocks*, extending N. and S. about a mile, being nearly 2 cables' length in breadth. The least water over it is 9 feet; but in the intervals between the rocks there are 5 fathoms. Its N.W. end lies W.N.W. ¾ W., distant 2 miles from Cape Trafalgar; and its S.E. end lies W.S.W. ¾ W., at about a similar distance. When you are upon the northern end of this shoal, Trafalgar Tower will be in one with the Boqueron; and when upon the shoalest part of this danger, the same tower will be in a line with the highest part of the high land of Meca. Between this shoal and the cape is a channel, with a depth of 6 and 7 fathoms. Here the water appears to boil and break, but this is merely the effect of the counter-currents, and there really is no danger; yet during a heavy swell of the sea, and the wind unsteady, it would be highly imprudent to venture through it.

There is another *bank* off Trafalgar, extending 1½ mile N.N.W. and S.S.E., distant between 3 and 4 miles from the cape, the least water upon which is 3 fathoms, while round it are 8 and 10 fathoms: its northern part lies N.W. by W. ½ W., 3¾ miles from the cape, and has the Tower of Trafalgar in one with the Tower of Meca. The S.W. end of this bank bears W. ¾ N., distant 2¾ miles from the cape, and S.S.W. from the Tower of Conil.

E. by S. from Meca Point and Tower is the Barcadero, or landing-place of Meca; this is a low beach, with a little creek affording a run of fresh water. Here are the cove and river of Barbate, before which the anchorage is good, but the river is narrow and shallow; some *rocks* also lie off the cove. To the south-eastward, and about 4½ miles from Meca Tower, is the point and Tower of Sara; this is of moderate height, near the sea, but forms a mountain inland, with two towers on its summit.

From hence a sandy cove extends to the south-eastward, 2¼ miles, to Cape Camarinal, which cape is low, but has a watch-tower upon it, and some rocks scattered about its point.

Cape de Plata is a good mile beyond Cape Camarinal, and formed by the foot of a mountain that descends gradually towards the sea, making a point which has several rocky islets about it. There is also a watch-tower upon it. Between Camarinal and Cape Plata is a *flat sandy beach*, where vessels may find shelter from east and north-easterly winds; large vessels frequently ride here in 7, 8, or 10 fathoms water, and small ones in a less depth, having a cable carried on shore. Small vessels also ride in the cove between Camarinal and the tower of Sara, during fair weather; but you must be observant of the changing of the wind; for should it blow from the S.W. you will have scarcely room to weigh and get under sail. The interior of the land from Meca Point to Cape Plata, is mountainous, and of considerable elevation.

PALOMA.—S.E. ¼ E., distant 4½ miles from Cape Plata, is Paloma Point and Tower, with *several rocks* before it; between these points is the Cove of Bolonia, with good anchorage within a mile from the shore. At 3¼ miles from Paloma Point is the Tower and Point of La Pena; between these points is the Cove of Valdebaqueros, giving shelter to small vessels. Near the east part of Paloma Point is the River Puerco, falling into a small creek between two ledges of rocks fit only for small craft. A range of hills extends from Paloma to Pena Point, appearing with several patches of white sand.

TARIFA.—Nearly 4 miles from La Pena is the chapel of Sta. Catalina, near which stands the town of Tarifa; and about ⅔ of a mile from it is the small island, or rather peninsula, of Tarifa, it being now connected with the coast by a sandy isthmus: this is low and level, and on which is erected a lighthouse, exhibiting a *fixed light*, elevated 132 feet, and visible 20 miles, in latitude 36° north, longitude 5° 37′ west. On the outside the water is generally deep, but on the S.W. side is the Rock Marroquina, which lies about half a musket's shot from the shore; but there are some shallows to the north-westward.

The CABEZOS.—About 2¼ miles S.S.W. to south from Point Paloma, 5 miles N.W. by W. from the Island Tarifa, and nearly W.S.W. from the Tower of Pena, distant 3 miles, lies the *Cabezos rocky shoal*. It is said in low tides the Cabezos will not have more than 5 feet water over them, while a very little way off there will be 2½ and 3 fathoms; and further out 7 and 11 fathoms. Many vessels have been wrecked here; and, therefore, the greatest care must always be taken to give them a fair berth, by not bringing Tarifa lighthouse to the southward of E. by S., when above a league from it.

The *Rocks of Pena, or La piedra de Valdebarqueros*, which at high water have but 2 fathoms over them, lie W.S.W. from the Tower of Pena, distant 1½ mile, and N.W. by N. from the Island of Tarifa, distant 4 miles. The channel between it and Point Pena is above a mile broad, and in it are 4 and 5 fathoms water.

Arroyo del Puerco, or *West Bank*.—N.W. by W. from the Cabezos, is a *rocky shoal*, called *Arroyo del Puerco*; it is about a mile long, but narrow, and with not less than 3 fathoms over it. Between it and the land are 10, 14, and 18 fathoms; and between it and the Cabezos from 8 to 10 fathoms. Westerly winds frequently form a whirlpool between this shoal and the shore.

New Bank.—W.S.W. of the Cabezos, distant ¾ of a mile, is a *new bank* of 3½ fathoms, running W.N.W. ½ N. and E.S.E. ½ S.; inside, and between this and the Cabezos, are 10, 11, and 7 fathoms; and on the outside, to seaward, it runs rapidly into deep water. The channel between the Cabezos and the New Bank lies with Tarifa lighthouse bearing S.E. by E. ¼ E.*

When you are certain you are to the eastward of the Cabezos, and bound to Gibraltar, it will be advisable to haul toward the land, particularly if the wind should be to the northward of west, lest the mid-current should carry you past it. On both

* Near this bank is said to be a *rock*, on which the *Thisbe* frigate struck several years ago. As this rock has not been found in the late surveys, it is most probable that the frigate struck on the Cabezos.

sides of the strait the water flows to the westward, and ebbs eastward; but in the bays the currents depend upon the tides, which are very variable.

On a point of the main, to the northward of Tarifa, stands the chapel of Sta. Catalina, already mentioned; it is situated upon a little hill, and appears at a distance like an island.

Nearly E.S.E. of Sta. Catalina is Camorro Point, high, broad, and steep, with many *rocks* about it; in the cove, between the island and town of Tarifa, small vessels may lie, defended from the winds from the S.W. round by N.W. to N.E; with other winds they generally run aground in a small creek east of the town; but large ships ride to the eastward of the island, opposite the sea-gate of the town, in from 15 to 18 fathoms. The coast now runs on towards the high points of Canales and Gualmesi,* on each of which there is a watch-tower; on the eastern side of the latter is a small cove, with a small rivulet, and a deep valley, covered with orchards. At $2\frac{3}{4}$ miles further on is Point Acebuche. The land between these points bends in to the northward, and within it stands the Castle of Tolmo; here the anchorage is good for small vessels, and sheltered from east winds round by north to N.W., having from 6 to 8 fathoms; the ground holds well, but the shores are rocky. A mile beyond Point Acebuche is Point del Frayle, distinguished by a watch-tower also, standing on the slope of a hill. A small island lies off its point, which, in appearance, is said to resemble a friar, and has *several rocks* about it. On the east side of the point is a small sandy cove, adapted only for small craft, sheltered from the west to the north, and having a castle for the defence of the anchorage.

E.N.E. $\frac{1}{4}$ N., about $2\frac{1}{4}$ miles from Point del Frayle, is Point Carnero, or Cabrita, between which lies Palomas, or Pigeon Island; at $\frac{1}{3}$ of a mile from the said point is Point Secreta, with a small creek between, suitable only for small craft. Palomas Island is distant $1\frac{1}{4}$ of a mile from the watch-tower on Point Carnero, being low and ragged; off its N.W. part are the two *Cabrita Rocks;* and $1\frac{1}{2}$ cable's length further west is a small *cluster of small rocks*, some above, and others under water.

The PEARL ROCK lies full $\frac{1}{3}$ a mile to the southward of the Island Palomas, there being 6, 7, 8, and 9 fathoms water between them; this passage may be used with a leading wind, taking care to pass by Palomas Island at the distance of $1\frac{1}{2}$ cable's length. On the Pearl, in one part, are only 9 feet water, the mark for it being the west end of Palomas Island in one with the third rising from Point Carnero, and a peaked rock off the same point, in one with a hill which makes like a sugar-loaf, to the eastward of St. Roque: this hill has a kind of saddle on its summit. In coming from the westward, you will have passed the Pearl whenever you can discover the town of St. Roque (which stands on a hill, and cannot be mistaken), over the rocks that run out from Point Carnero, or when that point bears about N. by E.; but take care not to bring Europa Point to the eastward of E.N.E. $\frac{1}{2}$ N.; you may then run in for the bays of Algeciras and Gibraltar, giving the port land a good berth; and if bound for Gibraltar, steer in until you have opened the Devil's Tower; stand on for that, into any convenient depth, from 20 to 6 or 5 fathoms, and anchor, mooring S.E. and N.W.; but in war-time, vessels generally anchor off the new mole.

To clear the Pearl Rock at night, keep the Europa Point light N.E. by E. $\frac{1}{2}$ E., not to the eastward, until the Tarifa light bears W. by N., northerly; and the reverse for entering the bay of Gibraltar. Vessels drawing above 18 feet, should not pass inside the Pearl Rock, as some 3-fathom *patches* are said to lie nearly in mid-channel.

ALGECIRAS and GIBRALTAR.—Carnero, or Cabrita Point, may be called

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† *Caution.*—The master of the *Norma*, from Marseilles, lately arrived in the Loire, reports that a *sand-bank* has lately formed about $\frac{3}{4}$ of a mile southward of Gualmesi, which is very dangerous, as the current since its formation, from the Island of Tarifa, bears directly on the shore. The said master has seen an English galliot strike on this bank, but being small, not drawing 10 feet water, was got off. Night setting in, Mr. Biroch (the master) was unable to ascertain the extent of the bank. Point Gualmesi should, therefore, be approached with caution, until a more satisfactory account can be obtained of its real position.

the western point, or boundary of these extensive bays. N.N.E. ½ N. from this point stand the tower and broad point of San Garcia, distant 1¾ mile. Between these points the shore bends inward, forming the Bay or Cove Getares, which is large and deep; but the heavy swell that always accompanies winds from the N.E. to the south-eastward, renders the anchorage unsafe; some rivulets are situated at the bottom of this bay, and have a considerable quantity of water in winter-time. Both the points of Cabrita and San Garcia are encompassed with *rocks;* but they are mostly visible, and therefore can easily be avoided.

Point Rodea, or Ridea, is ½ a mile to the northward of San Garcia; the opening between forms a kind of cove, but its entrance is encumbered with *rocks*. N.N.E. from San Garcia, distant a mile, is the Island of Algeciras, also called Verde, or Green Island, which is moderately high, and fortified; it is nearly surrounded by *rocks*, which render the approach to it, and the passage between it and the main, *exceedingly dangerous*, and fit only for small craft.

Algeciras is agreeably situated, and was formerly a place of considerable note, consisting of two towns, supplied with water from a fine aqueduct of hewn stone, ¼ of a league in length; but latterly it has gone into decay.

About ½ a mile N. ½ W. from Green Island is the Mole, running out easterly; to the southward of this is the River Miel, into which small vessels can go at high water. At ½ a cable's length east from the Mole lies the Galera Rock, having two parts of it uncovered just above the level of the sea; from it runs out a *reef* to the north-eastward. At ¼ of a mile N.N.E. ½ E. from the Galera is a *shoal*, with only 2 fathoms water over it. From the middle of Algeciras town a *reef* runs easterly; and from the north part of the town, where the Fort of St. Antonio stands, another *reef* of *larger rocks* extends. Continuing along the coast ¾ of a mile you will see the Tower of Almarante, moderately high, and surrounded with *rocks;* ¾ of a mile from which is La Polvera Tower; when these two towers come in a line, you should not anchor, for the ground is foul.

The Point of Rocadillo, or Rinconcillo, is ½ a mile further, and also encircled with *rocks;* from hence begins a low sandy beach, which extends round the bay so far as Gibraltar, the point of Mirador Fort and Punta Mala excepted. Above a mile to the northward of Rocadillo Point is the River Palmones, where the vessels belonging to Algeciras rendezvous in winter; it is deep and large, but its entrance is encumbered with *sand-banks*, particularly to the southward, which run out a great way. At ¼ of a mile east from Palmones River, is the Tower of Entre Rois, from which, at nearly the same distance, is the entrance to the Guadarranque River, which is of little note. Beyond this, about ¾ of a mile, is Fort Mirador, built circularly, and standing upon a little eminence. E.S.E. ¼ S. from the fort, is Point del Gallo; from which point the shore forms a kind of bight toward Point Mala; between them, a little way up the River Mayorgo, is a bridge. Point Mala is a little elevated, and has a few *rocks* round its point, rendering it necessary to give it a berth in passing: a castle is built upon its summit.

Northward from this castle, ⅓ of a mile, is the Hospital de la Sangre; and S.E. by S. from it, distant 1¼ mile, is Fort St. Philip, being the western extremity of the Spanish lines; these stretch across, and terminate at Fort Sta. Barbara, on the other side of the isthmus, the land being low and flat all the way to the Rock of Gibraltar, where it suddenly rises to a great height, its top being uneven, with several eminences thereon, and extending southerly until it slopes down to Europa Point, the eastern extremity of the bay, and well-known boundary of the Strait of Gibraltar.

Europa Point is in latitude 36° 6′ 20″ north, and longitude 5° 20′ 53″ west, on which a LIGHTHOUSE is erected, exhibiting a powerful fixed light, at an elevation of 150 feet, or thereabout, above the level of the sea, and visible 15 miles in clear weather. On the 25th of April, 1843, an additional section of the range of light from this lighthouse was opened, which renders it visible on the Algeciras coast, to the mouth of the River Palmones.

MOLE LIGHT.—A temporary *fixed light*, coloured, is shown at the New Mole. To the north it is *green*; west, *white*, and south, *red*.

The ROCK of GIBRALTAR is the Mons Calpe of the ancients, and one of the Pillars of Hercules; it consists of a great rocky mountain, about 2½ miles in length, and from ½ to ¾ of a mile in breadth. On its northern side is an isthmus, about 1½ mile long and ¾ of a mile broad, which connects it with the Spanish continent. The northern form of this rock is almost perpendicular; its eastern side is full of frightful and abrupt precipices; the southern side is narrow, and almost inaccessible, presenting hardly any possibility of approach from seaward; but the western side, although nearly as precipitous, rugged, and perpendicular as the others, yet slopes its base down towards the sea, and presents a kind of *pied à terre* in the small level spot upon which the town is erected; and this is amply secured from every sort of attack by extensive and most powerful batteries, so that it appears to be impregnable. The old mole runs out from the north end of the town, about N.W. by N., 1100 feet into the sea; the new mole is 1½ mile to the southward of the old mole, and extends outwards 700 feet; it has an elbow formed by the shore, and affords shelter for large vessels in winter, the furthest out lying in 6 and 5 fathoms.

ANCHORAGES IN THE BAYS OF ALGECIRAS AND GIBRALTAR.—In cases of necessity, vessels may lie at single anchor about ½ a mile from Cabrita Point, in from 18 to 27 fathoms, sand and small gravel, or from thence as far out as 38 fathoms, the ground holding well: and thence as far on as St. Garcia, but the bottom is not so good. At the distance of ½ a mile to the eastward or northward of Green Island, it continues bad as far as the depth of 15 fathoms; but from thence into deeper water, as far as 1¼ mile, or into 38 fathoms, the ground holds well, and is suited to large vessels, especially in summer-time; but further out the water is too deep.

ALGECIRAS LIGHT.—*Gibraltar*, June 6th, 1850.—For the convenience of the shipping standing off and on in the bay, and also for those wishing to anchor in Algeciras Roads, the fixed light hitherto situated on the beach at Algeciras, has been removed to Green Island, bearing about S.S.E., a mile from the former position. It is on an elevation 46 feet from the level of the sea, and visible 5 miles. From the the S.E. quarter the full light will be seen; from the N.E. and S.W. only half light; and from the N. and W. the green light will be invisible.

The best anchorage for all ships is from off the middle of Algeciras Town, towards Palmones River, and over towards the bridge of Mayorga. In all this space, except the spot we have before mentioned, where the two towers, Almirante and Polvora, come in one, the ground is good, being either sand or mud out as far as 23 fathoms; but the positions to be preferred are between the point of Rocadillo, or Rinconcillo, and the River Palmones, or between that river and the bridge of Mayorga. In this little space you will have 23 fathoms ½ a mile from the shore, the water deepening further out; it will, therefore, be advisable to sound before you anchor.

Vessels may also ride all the way from the bridge of Mayorga towards St. Philip's Castle, only keeping off Point Mala; but between the castle and the old mole the anchorage is preferable, being less deep: this is generally the English anchorage, under the guns; the smaller vessels lying near the mole, the larger further out. In the space also between the old and new mole there is good anchorage in any depth you please, keeping about ½ a mile off; not going too near on account of the rocks, nor further off lest you get into too deep water; this may also be done all the way, and even to the southward of Europa Point, but the water becomes deeper. A *pinnacle-rock* is stated to lie about 300 yards to the north-eastward of the point; it is of small dimensions, but there is water enough for a man-of-war to pass between it and the shore; and in moderate weather a vessel may anchor off the point in 10 fathoms water, on a bottom of clean sand, at a considerable distance from the land.

TIDES.—The tides in Gibraltar Bay commonly rise 5 and 6 feet; it is high water, full and change, at 2 o'clock.

THE STRAIT OF GIBRALTAR.

FROM CAPE SPARTEL TO CEUTA.

CAPE SPARTEL is the north-western point of Africa, and the kingdom of Morocco; being in latitude 35° 48′ 15″ north, and longitude 5° 54′ 25″ west. It is the south-westernmost point of the Strait of Gibraltar, and bears S. ½ W. from the tower on Cape Trafalgar, distant 22 miles. Cape Spartel appears at a distance, like an island, and in clear weather will be discerned 14 or 15 leagues off. Its outer point when seen from a short distance from the westward, seems irregular, with risings upon it like hummocks. It is quite clean, except some *high rocks*, which lie near it; these are steep-to, and may be approached without danger. On its summit is an old watch-tower.

From Cape Spartel to the western part of Tangier Bay the distance is 5½ miles: the coast is high and clear. About midway is the *rocky islet* of *Fraylecito*, or *Friar*, lying close in to the shore; but there is a *reef* off the point of Tangier, extending out to the distance of 2 cables' length, the bottom, round the point, being gravel and small stones.

The *Pacifico Rock*, lies one mile north of the eastern point of the town of Tangiers.

TANGIER BAY.*—E. ¼ S., distant 3 miles from Cape Tangier, is Cape Malabata, or Malabat, broad and projecting, having a battery and a tower on it. Off Cape Malabat lies a *ridge of rocks*, above a cable's length, uncovered at low water: further out is *another*, called *Almirante*, having 3½ fathoms over it, and said to be ½ a mile off; on this H.M. ship *Excellent* struck, the cape bearing S. by E. ½ E., distant, by estimation, full ¾ of a mile; while she remained on the rock there were 6 fathoms on one side, and 5½ on the other. She got off in less than a minute. This rock lies N. ¼ W. from the tower on the cape.

The bay of Tangier is situated between Cape Tangier and Cape Malabat, and is about 1½ mile deep, affording convenient anchorage opposite the town, in from 9 to 12 fathoms, sand. On the east side of the bay is a *ledge of rocks* under water, lying N.N.E. and S.S.W., about 100 fathoms in length: at low water spring-tides, even in calm, a rippling may be seen over them; the marks for them are, the old bridge at the bottom of the bay, bearing S.W. ¾ W.; Tangier Point W.N.W. ½ W.; and Cape Malabat E.N.E., distant 2 miles. On the shoalest part of the *ledge* there are only 12 feet, with 5 fathoms close to them, and at a short distance off 8 fathoms, in which depth you will be clear of danger; you will avoid them by keeping Gibraltar Rock in sight clear of Cape Malabat.

The best marks for anchoring in the bay are, Cape Malabat E.N.E.; Old Tangier S.E. ¾ S; the old bridge S. by W. ¼ W.; the northern point of Tangier Castle W.N.W., and Europa Point well open of Cape Malabat E. by N. ½ N.: with these marks on, you will be in the only clean part of the bay, and have 9 and 10 fathoms, fine sandy ground; the other parts being interspersed with broken coral, rocks, &c., very destructive to hempen cables. There is a mole running from Tangier eastward, where small vessels may ride, before the town, in 2, 3, or 4 fathoms, protected from

* At Tangiers there is said to be a fixed light on the Fort, but we are uncertain of its permanency.

northerly winds; there is a wall about the town, and some fortifications; and on the southern side of the bay, a high and pleasant-looking hill. A Levant wind causes a heavy swell to tumble into it, which makes a ship roll deeply. It is high water at 1h. 42m. p.m.; the flood-tide sets to the eastward, and ebb to the westward; but 2 or 3 miles off shore, to the contrary. The tides rise 5 feet, full and change.*

A large mooring-chain has been discovered on the western side of the bay, supposed to have been laid down by the English after the fortress came into their possession on the marriage of Charles II. to Princess Catherine of Portugal. This chain has probably caused the loss of many anchors and cables, which were chiefly attributed to coral and sea-weed. It lies in an east and west direction, north of the parallel of the town, and about a mile distant from the landing-place, and $1\frac{1}{4}$ from the shore on the southern part of the bay. The best anchorage is between this chain and the reef, already described, on the eastern side of the bay.

Tangier to Ceuta.—All the coast from Tangier to Ceuta is rugged, and encumbered with rocks and projecting cliffs; the interior of the country is mountainous; and S.W. $\frac{1}{2}$ S. of the Rock of Gibraltar, is that remarkable and lofty mountain, called Sierra Bulloness, or Ape's Hill. Five miles E. $\frac{1}{2}$ S. from Cape Malabat lies Point Al Boassa having several rocks near it. The *Jaseur Rock* with only 11 feet water on it lies N.W. $\frac{3}{4}$ N., one mile from the point, having a *patch* of 4 fathoms between them, and another *patch* of $4\frac{1}{2}$ fathoms lies one mile N.N.E. from the point. E. $\frac{1}{2}$ S., 9 miles from Cape Malabat, lies the point of Alcazar, high and steep, with a *reef of rocks* about it; between are 2 or 3 coves, where vessels may anchor in light winds close to the land, in from 18 to 9 fathoms. E.S.E. $\frac{1}{4}$ E., 2 miles from Point Alcazar, is that of Zannar, low and projecting, having a bay or cove on each side of it. E. by N. $3\frac{1}{2}$ miles from Zannar, is Cires Point. The point of Cires is low, but gradually rises up to a sharp-cornered mountain, very remarkable, called El Cuchilla, or the Gap of Cires.

Nearly a mile E.S.E. $\frac{1}{4}$ E. from Point Cires, is the point of Lanchones, having between them a bay $\frac{3}{4}$ of a mile in depth, with a flat beach, and anchorage in 15 fathoms. At $\frac{1}{2}$ a mile from Point Lanchones is that of Cruzes, the shore between being steep over the water, with some *rocks* near to the former point. Cruzes Point is high and steep-to, with several *rocks* at its base; but Lanchones Point is not so high, and much more even. Rather less than a mile from Cruzes Point, in a S.E. by E. direction, is the Fronton de Almanza, which is a broad, high, and abrupt precipice. Between Cruzes and Almanza the land bends inward, and forms a cove, with a small sandy beach. At 2 miles E. $\frac{3}{4}$ S. from Point Almanza, is Leona Point; between them is the Island Peregil, a high barren *rock*, having 18 fathoms water close to its outer side. Point Leona, the northernmost point of this part of Africa, is steep-to, of a moderate height, and distinguished by a large tower in ruins; between Point Leona

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* COAST OF MOROCCO.—*Tangiers*, Sept. 15th, 1843.—In consequence of several boats' crews having landed lately, from shipping of various nations on the open coast of Morocco, or West Barbary, in search of, it is supposed, water, or other provisions,—The Moorish authorities are desirous that all persons be cautioned, that it is not only against the law of the land, and against the sanatory regulations, to disembark on any part of the coast, in places where there is not a port open for their reception; but that, in consequence of strict injunctions given to the people of this country by their Government, to prevent any person whatever setting foot on land, or approaching near to it, on the open coast, the lives of those who infringe this law in this respect are exposed to danger.

The undersigned feels it, therefore, his duty to give all the publicity he can to this notice, for warning all commanders of vessels, and especially those navigating under the flags either of the United Kingdom or the kingdom of Hanover, or of the Hanseatic Republic of Lubec, Bremen, or Hamburg, not to venture, upon any account, to land, or allow any person under their care, or orders, to land, or approach within musket-shot of the coast, of Morocco, or West Barbary, excepting within the harbours of any of the well-known ports of this country.

(Signed) E. W. A. Drummond, *H.B.M. Consul-General.*

and Peregil, or Parsley Islet, there is good anchorage in 8 fathoms water. Some small islets lie off its western point.

At $1\frac{3}{4}$ mile S.E. by E. from Leona Point, is Point Torre Blanca, or White Tower Point, which is high, abrupt, and of a dark colour, inclining to a reddish-brown, with the ruins of a tower upon it, and some islets at its base. About $\frac{1}{4}$ of a mile to the eastward of Torre Blanca is a *shoal*, described by Tofino thus :—"This shoal is about the size of the hull of a man-of-war, with from 3 to 4 fathoms over it, excepting where the rock is highest, and the depth only a fathom, occupying a space equal in size to a large long-boat. Between this rock and the shore there are from 8 to 9 fathoms, rocky bottom, the channel being only about a cable's length broad, and rendered narrow by some islets projecting $\frac{2}{3}$ of a cable's length from the land: on the outside of this shoal are 3 and 9 fathoms, also rocky ground. From the shoal the outermost islet of Torre Blanca appears in a line with Point Leona; the ruins of the tower with the upper point of Ape's Hill S.W., and Point Bermeja on with the N.E. corner of the walls of Old Ceuta."

Between Point Leona and Point Blanca is the cove or bay of Benzus, where vessels may anchor in 18 fathoms, sandy ground, and at the distance of 2 cables' length from the shore, protected from south-easterly and south-westerly winds. From this anchorage the islets of Torre Blanca will bear E.N.E. $\frac{1}{2}$ E.; a remarkable pyramidical-peaked hill S. by W. $\frac{3}{4}$ W.; and Point Leona will be in one with Tarifa bearing N.W. $\frac{1}{2}$ N.

About a mile S.S.E. $\frac{1}{2}$ E. from Torre Blanca Point, is Point Bermeja, or Red Point; this also is high, and has a tower upon it in ruins. The coast between them is all bordered with *rocks*, some above and some under water; but on the outside of these, the water is very deep. Nearly $\frac{3}{4}$ of a mile to the south-eastward of Bermeja Point is Point Benites, with the two little flat islets of El Campo before it.

CEUTA.—This is a fortified sea-port, immediately opposite to the Rock of Gibraltar; it is built upon the site of the ancient Abylo, one of the Pillars of Hercules, and supposed to be of Carthaginian origin, formerly colonized by the Romans. In 1409 it was taken from the Moors by John, King of Portugal; and after the death of Sebastian, fell to the crown of Spain, to which it was finally ceded by the treaty of 1688, and is now the only one of the numerous conquests in Morocco which Spain still retains. Like Gibraltar, its natural position, and the strength of its fortifications, render it almost impregnable.

The peninsula is generally called Almina or Almira, and contains both the suburbs and fortress of Ceuta; the old town being merely a space of ground exhibiting remains of old walls, towers, and ancient battlements. It extends about $1\frac{1}{2}$ mile east and west, and is surrounded with *rocks*, running out a cable's length from the shore. On the eastern and most elevated part of the Almina, is the Acho, or Castle of Ceuta, standing in latitude 35° 54′ north, and in longitude 5° 17′ west. To the westward are six little hills; on the western skirts of the Almina are the suburbs; then the city, which is fortified, between the suburbs and main land.

CEUTA LIGHT.—Established on Almina Point, revolves every minute, is elevated 483 feet above high water and visible 27 miles.

A revolving light is exhibited at the northern side of the Government Palace, which, in clear weather, may be seen at the distance of 7 miles.

Punta Santa Catalina, the northernmost point of the Almina, is low, and has several *rocky islets* lying off it. Between this and the rocky islets of El Campo, is the anchorage in the lesser bay of Ceuta: here you will have indifferent riding in from 13 to 8 fathoms water, the ground being mostly sand and loose stones. To find the anchoring ground, you should observe and bring the Calls del Obispa, or Bishop's Street, open; this street commences on the northern side of the Governor's house; and the mark will lead you exactly to the spot. Moor N.E. and S.W., letting your longest cables be to the north-eastward.

W. ¼ S. from the Acho (or castle) of the Almina of Ceuta, lies the Point of Castillejo, low, round, and covered with trees, the coast between forming a bay with a point, and the small Island del Mal Nombre; and about S.W. by S., distant a mile from the Point of Castillejo, is a river of the same name. S.W., nearly 8 miles from the Acho, is Mount Negron, rising near the sea, lofty and dark, having a square tower upon it; and S. by W. ½ W. from the Acho, distant about 4 leagues, is Cape Negro, or Porcas, of moderate height, surrounded with islets, and having a round tower upon it.

Between Point Almina on the north, and Cape Negro on the south, is the Great Bay of Ceuta, being 11 miles long, and about 3 miles deep, in which a fleet may anchor in any convenient depth, on clean ground, at 1½ or 2 miles from the shore; but there are some *foul spots*, in from 10 to 17 fathoms water, which should be avoided. Here you may ride in smooth water, sheltered from the winds from N.N.W. to S.W., but exposed to all others.

Ships are better sheltered in Ceuta than in Tetuan Bay; but on account of the situation of the garrison of Ceuta, it is less frequented in times of war. When the easterly or Levant winds come on, it becomes necessary immediately to get under-way. The usual approach of those winds is indicated by a swell, or current, from that quarter, and by a clear atmosphere for some hours before the passing clouds begin to cap the hills. When you see the Ape's Hill and the summit of Gibraltar covered with clouds, be assured the Levanter, or easterly wind, is coming on, and will continue for some time.

Hydrographical Notes on the South-East Coast of Spain.

By Lieutenant (now Captain) G. H. P. White, R.N.

Beating through the Straits with the Wind at West.—This can be accomplished by any kind of vessel, line-of-battle ship included; the latter, however, should never attempt it, except with a strong steady breeze, and at spring-tides.

As it is high water, both at Gibraltar and also in the Straits, at 2 p.m., at full and change,* a vessel wishing to beat through should contrive, if possible, to be off Cabrita Point by the last quarter ebb; and should she be a small vessel, she should go inside the Pearl Rock, to enable her to be abreast of Pigeon Island immediately the flood commences. Should the wind be strong and steady, and the flood-tide good, she ought to get up to Tarifa the first tide, and there remain until the next, to cross over to Tangier Bay, unless she gets a good start from the northward. If she remains at Tarifa, she must get under-way at the last quarter ebb, and stretch over to Tangier, where she will meet the tide on the African shore, which will enable her to work round Cape Spartel, the tide being the same on the African as on the Spanish shore, and the former perfectly free from danger when to the westward of Tangier.

Should a ship not get up to Tarifa, the first flood-tide, she can always anchor on the Spanish coast; one of the best spots is off the tower of Gualmesi,† about 4½ miles from Tarifa, where the ground is good; the land hereabout is high and precipitous, with the tower above mentioned on its summit. On its eastern side is a small cove, with a deep valley covered with orchards and gardens.

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* Extraordinary changes take place at times in the time of high water. "I have known," says Captain White, "the flood-tide to run until 5 p.m. on the day of full moon, when it should have been high water at 2 p.m." These variations depend, there is little doubt, on the wind; but so irregular are their results, that it is almost impossible to form any correct theory concerning these anomalies.

† See note on sand-bank off Gualmesi, page 42.

The anchorage at Tangier Bay, although very much exposed to east and north-east winds, with a heavy sea at times, is, however, perfectly safe, particularly when a vessel anchors well to the eastward, so as to be sheltered by Point Malabat. The best anchorage is Cape Malabat E. by N. ½ N., custom-house, west. Ships should always moor in this bay during the winter months.

Beating from Tangier to Gibraltar, *wind blowing hard from the eastward.*—To perform this, a ship should get under-way at the last quarter flood, and stand across to Tarifa, or so far to the northward as the wind will allow; by the time she has arrived off Tarifa, she will get the ebb-tide, which, if strong, will more than likely carry her into Gibraltar in three or four tacks. Remember, when working, particularly to the westward, that you make very short tacks, keeping close to the land on the in-shore one.

When intending to anchor off the new mole, with the wind at east, a ship should keep Europa Point close on board, and be put under snug but commanding sail, as it will be necessary to have everything ready to brace round at a moment's notice, taking special care to keep as close to the rock as possible. If this be not attended to, it will be more than probable that she will be some hours beating about to gain the anchorage. Top-sails, jib, and spanker, are the most convenient sails to be under; but it will greatly depend on the tide, for the flood sets from Europa to Cabrita,—in fact, sweeping the shores of the bay; therefore, if, with a flood-tide, it be possible to keep her head towards the mole with the fore-and-aft sails, particularly in a large ship, it would be advisable, as she would then drift into her anchorage without the disagreeable necessity of bracing round every minute to the flaws and puffs, which are extremely violent in a strong Levanter.

Should it be ebb-tide on approaching Europa Point, and the wind at all to the northward of east, carry all convenient sail, working over on the western or Algeciras side of the bay, where the merchant-vessels usually anchor; you may then shorten sail, and run down under topsails to the new mole.—*Extracts from the Nautical Magazine, December*, 1843.

Remarks on the Tides and Currents in the Strait of Gibraltar.

The tides on both sides of the strait would be regular, if it were not for the influential effect of the prevailing winds. From Cadiz the flood sets towards Cape Trafalgar, where it is high water at ½ after 5, full and change. At Tarifa it is high water at 2 o'clock; at Gibraltar at 1h. 25m.; the tide rises 4 feet. The flood again sets from Europa Point towards Cape Carnero, and thence to Tarifa, so that it meets the tide from the west off Trafalgar, where it is low ebb at the time it is high water at Tarifa. The tide in this way runs as far at 2 miles off the coast: and at that distance from Tarifa it flows until 2 o'clock. The tide will continue perceptible as far as Malaga, where it rises about 3 feet; but beyond this it gradually becomes imperceptible.

On the southern coast of the strait, from Cape Spartel to Ape's Hill, another tide runs along shore to the westward, as shown in the charts. In the great cove, opposite to Tarifa, it is high water at 10 o'clock; but more to the westward, and near Tangier, at 1h. 42m., and in the offing it continues an hour longer.

In the middle of the strait, the current from the Atlantic Ocean generally sets in to the eastward. This is supposed to be occasioned by the great and continual evaporation constantly going on from the surface of the Mediterranean Sea, the intermediate rivers not affording a sufficient supply to restore the exhaustion; while also under-currents have been conjectured to return a great portion of these waters into the Atlantic back again; and the changes, counter-currents, and whirlpools, which take place near the shores, caused by varying winds, contribute to restore and keep up the equilibrium. However this may be, it is ascertained that there actually is a tide setting both outward and inward along each shore: that from beyond the vicinity of

Malaga, the flood sets round the coast, in a westerly direction, towards Gibraltar, and thence along the coast of Spain, until it meets that which comes from the west off Cape Trafalgar; and that a similar current, and in a similar direction, sets along the African shore, until it passes Cape Spartel, and is lost in the Atlantic Ocean.

But although it has hitherto been asserted, that the central stream invariably and unremittingly runs eastward, very rarely, if ever, standing still, yet there is reason to believe this is not strictly the fact, but that a current is sometimes to be found running outward to the west, occasioned perhaps by an extraordinary tide, a surcharge of water in the Mediterranean, or the prevalence and continuance of an easterly wind, or an union of all these circumstances together. This opinion seems to be strongly corroborated by the observations of several modern navigators. Capt. Malling, of H.M. ship *Cambridge*, says, "he is one of those persons who can bear testimony to the current running out of the strait, with much greater velocity than he ever found it running into the Mediterranean." And Capt. Livingstone in 1822, observed the general current in the strait to run westward, instead of eastward, for some hours, all across the Strait, several vessels at this time being carried right out to the westward; and some of them drifted, in the centre of the strait, from abreast of Tarifa, to nearly so far as to be opposite to Cape Spartel.

Capt. Barret states, "that in 1820, when he was off Tangier Bay, he felt the current set for above 3 hours decidedly to the westward; and that while the water at the surface was going apparently to the eastward, a westerly current had hold of the bottom of the ship." A London ship, when at anchor at Tarifa, found the tide running at the rate of 5½ knots. And Capt. Walker says, "he has been obliged to have a man at the wheel steering his vessel for the tide, when at anchor under Cape Spartel."

A respectable writer, speaking of this under-current, states, "that the Mediterrean Sea is said to be rather salter than the waters of the Atlantic Ocean." That it is not more so, is ascribed to an under-current, salter than that of the ocean, which runs out of the strait, and unloads the waters of their excess of salt.

From the above it will appear, that the current of the Strait of Gibraltar is in some measure regulated by the tides, and that its velocity will, according to the tide, vary from 3 to 6 and 7 miles an hour. To the westward of Tarifa, about the full and change of the moon, it sometimes sets to the westward quite across the strait; but eastward of Tarifa, it sets, more or less, to the eastward. Mr. Ignatius Reiner, pilot of Gibraltar, says, "that with westerly winds the current in the middle of the strait, between Europa Point and Ceuta, will often equal the rapidity of 7 miles an hour; and that at such times every point in the bay will form an eddy or whirlpool at a considerable distance from the land, which may prove dangerous to approach."

From all these considerations, it appears that a ship coming from the Atlantic with an easterly wind, may easily beat through the Strait of Gibraltar, into the Mediterranean Sea, by keeping and tacking between the two boundaries of the central currents,* but always somewhat nearer to the coast of Africa than to the European shore, the winds thereabout being generally more moderate, for even when in the neighbourhood of Tarifa, the easterly wind is strong enough to put a ship past her close-reefed topsails; and should the gale from the eastward blow strong, and threaten a tempest from the south-eastward, you can then take shelter under Cape Spartel until it moderates. But if you should be within the strait, and bound eastward, if a storm is threatened from the S.W. quarter, then you can run for, and take shelter under, Almina, or the Point of Ceuta.

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* Capt. G. H. P. White, R.N. in his *Hydrographical Notes*, remarks, that "a vessel may tack in the central current, with the wind blowing hard from the east, for a month, without getting an inch a-head. But even under treble-reefed top-sails, by keeping close under the Spanish shore, and working the ebb-tide, she will, most probably, get into Gibraltar, if required, in a few tacks.

"The central current setting into the Mediterranean, sometimes after a long continuance of easterly winds, sets to the westward, but this is a phenomenon which rarely occurs."

Remarks on making for, and sailing through, the Strait of Gibraltar, either from the Westward or the Eastward.

In making for the Strait of Gibraltar from the westward, the mariner will insensibly be struck with the appearance of the rival mountainous shores of Europe and Africa, vying with each other in their towering grandeur and sublimity; while the singular prospect of the almost insulated Rock of Gibraltar, jutting out into the sea, and forming the narrow passage into the Mediterranean, can scarcely fail of giving the idea of the vast waters of the Atlantic having originally forced their way between, and thus separated the two continents, one from the other; while these magnificent and prominent features of nature, enlivened by a brilliant sun, and that luminous tint of colouring peculiar to southern latitudes, constitute a panorama of inimitable scenery, which the pencil can but feebly describe.

Vessels bound to Gibraltar from the westward, and having passed to the southward of the Cabezos Shoals, should haul in for the Spanish main, especially if the wind should be to the northward of west, otherwise the current may carry them to the eastward of the rock: therefore, when the town of San Roque is seen open to the eastward of the rocks off Cape Carnero, or Cabrita, they ought to immediately haul up for the bay, giving the rocks off the cape a good berth. Having run up the bay so far as to open the Devil's Tower, which stands at the north end of Gibraltar, then they should steer directly towards it, and anchor in whatever depth they may think most convenient, taking care to moor S.E. and N.W., so as to have an open hawse with a S.W. wind.

In coming from the westward, and bound up the Mediterranean, the best anchorage in the bay of Gibraltar will be from abreast of the northern part of Algeciras on towards the River Palmones, as before described; you will then be able, with a westerly wind, to clear Europa Point; but if from the Mediterranean, and you are going westward, then run for the bridge of Mayorga; for, with an easterly wind, you may weather Point Cabrita.

In winter time, the best station is from the Palmones to Fort Mirador, for there you will be sheltered from the S.E. winds, which are considered the most dangerous of any; and if you are between the bridge and Algeciras, moor N.E. and S.W., with 2 cables on the N.E. anchor; but if between the bridge and Gibraltar, moor N.W. and S.E., with 2 cables on the S.E. anchor; for there the S.W. winds are the worst; but if unable to reach either of these stations, and the winds within the bay differ from that without, then come-to in that situation most convenient for running out with the wind you are desirous of.

Should you happen to be carried by the current to the eastward of the rock of Gibraltar, you may obtain good anchorage in 20 fathoms water, having the Cabrita and Europa Points in one, and the Devil's Tower just open: there are gradual soundings towards the rock, shoaling to 4 fathoms. From this anchorage you may, by taking the western tide, turn into Gibraltar Bay, only by standing a very little way off Europa Point. You will readily perceive the ripple between the current and the tide; and when you think you will be able to weather the point, it is not advisable to stand direct into the bay, but make a short tack or two in the tide that sets from Europa to Cabrita Point; otherwise you may get into the eddy tide, which will take you on the weather bow, and disappoint and deceive.

In sailing out of the bay from the anchorage with a strong easterly wind, set no square-sails until you have advanced to leeward of the town.

Coming from the eastward for Gibraltar Bay, give Europa Point a good berth, because the Rock of Gibraltar frequently stops the easterly wind, unless it blows very strong; it then comes away to the westward on shore: the currents also near the point are strong, and often run contrary to one another.

Ships from the eastward, with a Levant wind, intending to anchor between the Old Mole and the River Palmones, should, if it blows fresh, give Europa Point a berth of ½ a mile, and run to leeward until they are nearly half-way across the bay, in order to avoid the furious gusts of wind and eddies from the rock, which greatly endanger the masts and yards; and when to leeward of these dangerous flaws, haul up toward the head of the bay, where a steady wind will be found blowing over the neutral ground; she may then, by short boards, work up to the anchorage, or to the Old Mole, if necessary.

In coming from the eastward with clear weather, the Rock of Gibraltar will be seen 40 miles off, being higher to the northward than to the south, and looking like an island; at the same time, you will perceive the Sierra Bullones, or Ape's Hill, on the African coast, which also appears isolated; between these two you may enter boldly.

It is no uncommon thing, in dark weather, to mistake the Rock of Gibraltar for the Sierra Bullones, and La Carbonera for the rock. *La Carbonera* is a lofty *extensive ridge*, 6 miles north of Gibraltar, having a watch-tower on its summit; the land between it and the rock being very low, as already noticed. This is a dangerous mistake, and has often proved fatal; for the vessel will get embayed with E. or S.E. winds in the bay of Tunaro, which is falsely imagined to be the entrance to the Strait of Gibraltar, and thus she runs on shore. A similar error happens when the Sierra Bullones is mistaken for the rock, and the low lands to the southward of that ridge for the strait's mouth: you will then be driven by N.E. and east winds into, and probably wrecked within, the Bay of Tetuan.

"To prevent such accidents," says Tofino, "when coming from the Mediterranean, it will be advisable to run for the coast of Spain, and endeavour to get sight of the Sierra de Estaponia, in latitude 36° 28′ north, the highest part of which and the rock of Gibraltar bear from each other N.E. ½ N. and S.W. ½ S., nearly. Without this landmark, it will hardly be prudent to attempt the strait; but rather to stand off and on, in thick blowing weather, until, by the position and bearing of Estaponia, you can clearly discern the Rock of Gibraltar."

General Observations on Navigating the Coasts of Spain and Portugal, from the Bay of Biscay to the Strait of Gibraltar.

The subject of current in this part of the ocean, along the coasts of Spain and Portugal, is well worthy the attention of the mariner; and we cannot do better (as well as to the respected memory), than offer some remarks of Major Rennel, upon what is now becoming of such essential importance, and occupying the researches of the learned.

This gentleman observes, that "those navigators who depart from the parallel of the southern part of the Bay of Biscay, say 45°, and sail to the southward, will be assailed first by a S.E. current, and then by an easterly one, until they have passed Cape Finisterre; when the current will again turn to the southward of east, and gradually become a S.E. current, until, having doubled Cape St. Vincent, it becomes easterly again. This is owing, no doubt, to the indraught of the Strait of Gibraltar; and this easterly current is general across the mouth of the bay, from Cape St. Vincent to Cape Cantin on the Coast of Africa.

"The rate or velocity of this current varies very considerably at different times; that is, from 12 to 20 or more miles in 24 hours, 16 being a medium rate. There is one example of 130 miles in 8 days, or 17½ miles per day; but there is another of only 12. Near the coasts of Spain and Portugal the current is always southerly, owing, perhaps, to the falling in, obliquely on the shore, of the great mass of water

brought by the S.E. current, which can only run off towards the south, and rounding Cape St. Vincent, make towards the strait's mouth. It may be taken for granted." says the Major, "that the whole surface of that part of the ocean which is situated between the parallels of 30 and 45 degrees, to the distance of 100 or 130 leagues off the shore, is in a progressive motion toward the mouth of the Strait of Gibraltar."

It will readily be seen from the above, how absolutely necessary it is that the mariner, in navigating these coasts, should understand, and make a proper allowance for, these currents; by attending to their effects upon his vessel, he will ensure the safety of his ship, and the lives of his crew.

WINDS.—It has been said, that the winds on the coasts of Portugal are generally from the northward during a period of $\frac{2}{3}$ of the year. At Lisbon it has been found to vary in-shore from the out-shore wind; thus, when the wind in the river was from the S.E. or S.E. by E., that in the offing would be S. by E. or south. Mariners acquainted with the navigation between the capes of Sta. Maria and Trafalgar, in what is commonly called the bay, or Gulf of Cadiz, generally labour under great apprehension of a gale of wind from the S.W.; and from want of knowing how these gales come on, frequently get into difficulties. The S.W. gales generally commence with the wind at S. by W. or S.S.W., and continue blowing on these points 5 or 6 hours, although the sea sets in from the westward; and it is too common for persons unaccustomed to navigate in this bight, to have their minds impressed with the danger of the *shoals* lying off Point Regla, commonly called the shoals of St. Lucar, and falsely represented as very alarming. Under this apprehension, they are induced to haul their starboard tacks on board, and push for the Strait of Gibraltar; whereas the real danger lies at the entrance of this strait, and consists of a *dangerous reef of rocks*, with uncertain soundings, not to be depended upon.

Between Cape Trafalgar and Tarifa (and when you suppose yourself round them, and the strait open), in thick weather, and not able to see the land on either side, you will feel yourself in a very awkward situation to find out the drift of your vessel, or ascertain whether you are in a fair way to push through the strait; and this, should the gale hold on, and your ship be within the influence of the stream, you will be compelled to do, for you can get no information by the lead of the reefs and rocks which lie to the westward of the Island of Tarifa, and are *extremely dangerous*.

On the other hand, by standing to the westward, with the port tacks on board, at the commencement of a S.W. gale, when the wind is from the southward, for instance, at S.W. by S., and you make four points leeway, you will make a fetch to the westward of Ayamonte; or even with a N.W. course made good, you will weather the bar of Huelba, and the lead will inform you the distance the ship is off the land, 15 fathoms being the very shoalest part you should stand into along the north shore.

The outer shoal of St. Lucar is not at a greater distance than $2\frac{1}{2}$ miles N.W. from Point Regla; the ground outside the shoal is hard and even, with 10 fathoms water close to it; about $\frac{1}{2}$ a mile to the N.N.W. of it there is a *spot* of 8 fathoms. No allowance is made for a S.E. current, which always prevails when out of soundings, even to 60 fathoms.

The variation of the compass on the coast of Portugal and in the Strait of Gibraltar, may be taken throughout at 2 points westerly.

REMARKS ON THE DEVIATION OR LOCAL ATTRACTION,

It may not be improper to observe in this place, that the needle is subject to a *local attraction*, resulting principally from the masses of iron on board ship, by which it will be drawn more or less from the magnetic meridian, according as the disturbing cause is situated with regard to the needle; this effect is called the *aberration of the needle*. For further particulars on this subject, see pages 207 and 208, eleventh, twelfth, thirteenth, fourteenth, and fifteenth editions of *Norie's Epitome on Navigation*, in which excellent work will be found the following Table (see page 208), thereby showing the allowances that are made for the aberration of the needle, at the same time proving the extraordinary changes of the variation, according to the direction of the ship's head.

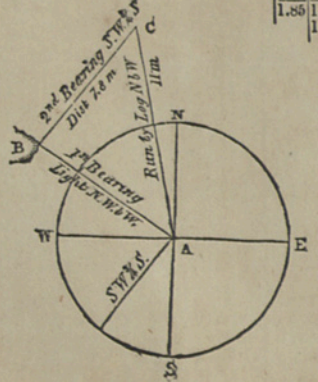
Ship's Head by Compass.	*Variations.*	*Ship's Head by Compass.*	*Variations.*
	° ′		° ′
North.	24 30W.	South.	24 30W.
N. N. E.	23 21	S. S. W.	25 39
N. E.	22 23	S. W.	26 37
E. N. E.	21 44	W. S. W.	27 16
East.	21 30	West.	27 30
E. S. E.	21 44	W. N. W.	27 16
S. E.	22 23	N. W.	26 37
S. S. E.	23 21	N. N. W.	25 39

Hence the variations to be allowed are opposite the courses steered; thus, if the ship's head is E.N.E., the variation to be allowed is 21° 44′ west; but if W.S.W., the variation to be allowed is 27° 16′ west. All the courses given in this work will be subject to this correction.

A USEFUL TABLE FOR FINDING THE DISTANCE OF AN OBJECT BY TWO BEARINGS, AND THE DISTANCE RUN BETWEEN THEM.

Difference between the Course and Second Bearing in Points of the Compass.

Pts	4	¼	½	¾	5	¼	½	¾	6	¼	½	¾	7	¼	½	¾	8	¼	½	¾	9	¼	½	¾	10	¼	½	¾	11	¼	½	¾	12	¼	½	¾	Pts
2	1.00	0.89	0.81	0.74	0.69	0.64	0.60	0.57	0.54	0.52	0.49	0.48	0.46	0.45	0.43	0.42	0.41	0.41	0.40	0.39	0.39	0.39	0.38	0.38	0.38	0.38	0.39	0.39	0.39	0.40	0.41	0.41	0.42	0.43	0.45	2
2½		1.12	1.00	0.91	0.83	0.77	0.72	0.67	0.64	0.60	0.58	0.55	0.53	0.51	0.50	0.47	0.46	0.45	0.45	0.44	0.44	0.43	0.43	0.43	0.43	0.43	0.43	0.44	0.44	0.45	0.45	0.46	0.47	0.48	2½
3			1.23	1.10	1.00	0.92	0.85	0.79	0.74	0.70	0.67	0.64	0.61	0.59	0.57	0.55	0.53	0.52	0.51	0.50	0.49	0.49	0.48	0.48	0.47	0.47	0.47	0.47	0.47	0.48	0.48	0.49	0.49	0.50	0.51	0.52	2¾
3½				1.34	1.20	1.09	1.00	0.93	0.86	0.81	0.77	0.73	0.69	0.67	0.64	0.62	0.60	0.58	0.57	0.56	0.55	0.54	0.53	0.52	0.52	0.52	0.51	0.51	0.51	0.52	0.52	0.52	0.53	0.54	0.55	0.56	3
4					1.45	1.30	1.17	1.08	1.00	0.93	0.88	0.83	0.79	0.75	0.72	0.69	0.67	0.65	0.63	0.61	0.60	0.59	0.58	0.57	0.57	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.57	0.57	0.58	0.59	3¼
4½						1.56	1.39	1.26	1.16	1.07	1.00	0.94	0.89	0.84	0.80	0.77	0.74	0.72	0.69	0.68	0.66	0.64	0.63	0.62	0.61	0.61	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.61	0.61	0.62	3½
5							1.66	1.48	1.35	1.23	1.14	1.07	1.00	0.94	0.90	0.86	0.82	0.79	0.76	0.74	0.72	0.70	0.69	0.67	0.66	0.65	0.65	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.65	0.65	3¾
5½								1.76	1.57	1.42	1.31	1.21	1.13	1.06	1.00	0.95	0.91	0.87	0.84	0.81	0.78	0.76	0.74	0.73	0.71	0.70	0.69	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.68	0.68	4
6									1.85	1.65	1.50	1.37	1.27	1.19	1.11	1.05	1.00	0.95	0.92	0.88	0.85	0.82	0.80	0.78	0.76	0.75	0.74	0.73	0.72	0.71	0.71	0.71	0.71	0.71	0.71	0.71	4¼
6½										1.94	1.78	1.57	1.44	1.33	1.24	1.17	1.10	1.05	1.00	0.96	0.92	0.89	0.86	0.84	0.82	0.80	0.79	0.77	0.76	0.76	0.75	0.74	0.74	0.74	0.74	0.74	4½
7											2.02	1.81	1.64	1.50	1.39	1.30	1.22	1.15	1.09	1.04	1.00	0.96	0.93	0.90	0.88	0.86	0.84	0.82	0.81	0.80	0.79	0.78	0.78	0.78	0.78	0.78	4¾
7½												2.10	1.88	1.70	1.56	1.45	1.35	1.27	1.20	1.14	1.08	1.04	1.00	0.97	0.94	0.91	0.89	0.87	0.85	0.84	0.83	0.82	0.81	0.81	0.80	0.80	5
8													2.17	1.94	1.77	1.62	1.50	1.40	1.31	1.24	1.18	1.12	1.08	1.04	1.00	0.97	0.94	0.92	0.90	0.88	0.87	0.86	0.85	0.84	0.83	0.83	5¼
8½														2.24	2.01	1.82	1.67	1.54	1.44	1.35	1.28	1.21	1.16	1.11	1.07	1.03	1.00	0.97	0.95	0.93	0.91	0.90	0.88	0.87	0.87	0.86	5½
9															2.30	2.06	1.87	1.71	1.58	1.48	1.39	1.31	1.25	1.19	1.14	1.10	1.06	1.03	1.00	0.97	0.95	0.94	0.92	0.91	0.90	0.89	5¾
9½																2.36	2.11	1.92	1.76	1.63	1.52	1.43	1.35	1.28	1.22	1.17	1.12	1.09	1.05	1.02	1.00	0.98	0.96	0.94	0.93	0.92	6
10																	2.41	2.16	1.96	1.80	1.66	1.55	1.46	1.38	1.31	1.25	1.19	1.15	1.11	1.08	1.05	1.02	1.00	0.98	0.97	0.95	6¼
10½																		2.46	2.20	2.00	1.83	1.69	1.58	1.48	1.40	1.33	1.27	1.22	1.17	1.13	1.10	1.07	1.04	1.02	1.00	0.98	6½
																			2.50	2.24	2.03	1.86	1.72	1.61	1.51	1.42	1.35	1.29	1.24	1.19	1.15	1.11	1.08	1.06	1.03	6¾
																				2.53	2.27	2.06	1.89	1.75	1.63	1.53	1.44	1.37	1.31	1.25	1.21	1.17	1.13	1.10	1.07	7
																					2.56	2.29	2.08	1.91	1.76	1.65	1.55	1.46	1.39	1.32	1.27	1.22	1.18	1.14	1.11	7¼
																						2.58	2.31	2.12	1.94	1.80	1.68	1.57	1.47	1.40	1.34	1.28	1.23	1.19	1.15	7½
																							2.61	2.34	2.12	1.94	1.80	1.68	1.57	1.49	1.41	1.35	1.29	1.24	1.20	7¾
																								2.61	2.34	2.12	1.94	1.80	1.68	1.58	1.49	1.41	1.35	1.29	1.24	8
																									2.60	2.33	2.11	1.94	1.79	1.67	1.57	1.48	1.41	1.34	8¼
																										2.58	2.31	2.10	1.92	1.78	1.66	1.56	1.47	1.40	8½
																											2.56	2.29	2.08	1.91	1.76	1.65	1.55	1.46	9
																												2.53	2.27	2.06	1.89	1.75	1.63	1.53	9¼
																													2.50	2.24	2.03	1.86	1.72	1.61	9½
																														2.46	2.20	2.00	1.83	1.69	9¾
																															2.41	2.16	1.96	1.79	10
																																2.36	2.11	1.92	10¼
																																	2.30	2.06	10½
																																		2.24	10¾



A.—The place sailed from.

B.—Flamborough Head Light.

C.—The place arrived at.

The Figure is constructed with a Scale 10 to an inch.

EXAMPLE.—Flamborough Head light bearing N.W. by W., and after running N. by W., 11 miles by Log. it bore S.W. ¾ S.; required the distance from the light, at the time the last bearing was taken.—Enter the Table with the difference, in points, between the ship's head and the first bearing (4 points), at the side, and the difference between the ship's head and the second bearing (11¼ points), at the top, which will give 0.71; then this multiplied by the distance run (11 miles), gives 7.8 miles—the distance from the light at the time of last bearing.—[See Figure.]

Difference between the Course and First Bearing in Points of the Compass.