

the form and nature of the skins in which the Andalusian wines were brought to their ships. And naming the wine contained in the skin by the skin which contained it, the wine was called by them *Sack*, a word long known in their language, and which is applied to certain envelopes of merchandize. This, as they said, was the wine in *Sack*.

My Cicerone seeing that I was no connoisseur of Sherry, then took me to be curious in some matters, and proposed to shew me the interior of the vaults. This was just what I wanted. We then continued along the avenue, each side of which was formed by casks, granite pillars succeeding others with arched roofs until lost in the distance and darkness, they appeared a confused mass. This architecture, rude and simple as it is, reminds me of the crypts of old cathedrals. But the most remarkable feature of it here is the mouldy vegetation which springs from the arched ceiling in its darkness. A moist pulpy mass, presenting a curious appearance, is always springing out from between the bricks. To the touch it seems like tinder, and it often appears covered with a sooty coating which disappears. The dock people are extremely touchy on the subject of this arabesque ornament, and don't allow it to be meddled with. According to them it is a proof of the excellence of the vaults. The curious fact is, that such kind of vegetation is never found but in vaults devoted to the conservancy of wine; and they believe that it is to the fumes of the wine this cryptogrammatic vegetation is due. Some of these fungus masses hung down like stalactites charged at the extremity with a cotton like appearance. We continued through these festoons, brushing them aside sometimes with the hand, and solid as they appeared, they would arrange themselves as we left them like linen which had been disturbed by the breeze. At short distances along our route large lamps were placed, the light from which however failed to penetrate the darkness of the vaults. But they served to give an idea of the distance we were going over; and they marked the presence of work without shewing the workmen. The ground which is level, is always covered with sawdust, and I forget how many millions of bushels are thrown on it every week. The tramways on which the pipes of wine are moved about, wind about in all directions, and altogether in one length would extend over a distance of thirty-six miles.

We have now reached the great subterranean road, each side of which is marked by a forest of posts on which, in several parts, thermometers are placed, and which are continually being consulted at least three times a day. It is well known that equality of temperature is essential to the due conservancy of wine, and the temperature of the vaults does not vary more than 2° between summer and winter. At the end of one of the dark transepts which branch off from the main line, I perceived for the first time a window which opened out to the street. The wall was twelve feet in thickness, and thence an opinion may be formed of the small quantity of light that enters through this small opening just enough in fact to make one wish for the light of the sun. Young men and old, and some veritable gnomes pass their lives in these vaults: the day in fact there consists of two nights, in one of

which they work, and in the other, take their rest. As we passed along, my guide directed my attention to a tower of masonry which occupied the whole height of the vaults, the bases of which however was below the floor. This tower which, after all, is but an oven of bricks has a certain celebrity, as known by the name of the Queen's tobacco pipe. It is, in fact, the furnace where certain smuggled merchandize, such as tobacco or tea is disposed of by the orders of the customs. If I am correctly informed, this pipe of the Queen's is some source of jealousy. More than one poor family would crave the articles which it consumes, and however damaged they may be, poverty would know how to turn them to account. At the time when I visited the docks, several weeks had elapsed since the flames of a sacrifice had been seen.

The value of each of these pipes of wine is about £70, and as there are twenty millions of these pipes in a vault, the amount of riches contained in these vaults, which extend over eighteen acres of ground, may be easily calculated. Besides, the brandy vaults contain about thirty-six thousand casks. Each pipe bears its own initials, which specify its owner, the year of its production, the date of its arrival in the docks, and the name of the vessel by which it was brought home. Some of these pipes were actually bearing a crop of fungus of the mushroom kind, but that is considered an honourable sign, not only of itself, but in favour of the parties in whose care it has so long remained. Each pipe pays for its lodging in the docks the sum of fourpence per week, and each barrel twopence. This is tolerably high, and some rich wine merchants of London, who are well known, expend a considerable sum every year for nothing more than the lodging for their wine. But it is right to add, that for this payment they are relieved of all care; their property is well looked after and quite safe and forthcoming whenever they please. Another advantage they have is, that they need not pay the duty on it as long as the wine remains in the docks, a consideration which has no doubt contributed much to the success of the docks. Who then would not admit that the wines of Spain and Portugal require long time to ripen. It is necessary the wines should remain in the wood for some years after their arrival in England, as the only means of correcting the faults of being new. Now the English know well how to calculate (to do them justice) and consider that the interest of the money for the duty is just as well in their pockets as in that of the government. All the time the wine is ripening and increasing in value the government get nothing by it. The merchant can employ, as he pleases, the funds he owes the government for duty up to the day of its delivery in his hands. The reduction of the duties of entrance might modify the habits of business of the English, but the increasing prosperity of the docks defies any modification of the tariff.

On leaving the vaults, I was in a curious condition. The ships in the docks appeared to be all in motion, even the warehouses were turning round before me like windmills, and I remembered hearing that persons on coming out of the vaults have suffered from intoxication

of the fumes of the casks of wine with which the air of the vaults is charged. The labourers themselves employed there, although sober, temperate men, know well this extraordinary effect of the fumes, for they soon contract an appearance in person and figure of the attendant of Bacchus, even Silemus himself. I felt as if I could hardly walk, and my thoughts were all upset. However, this unpleasant effect did not last long, thanks to moving about in the invigorating air. But it was a lesson, for I had in the same day a visit to the St. Katherine docks before me, and they were in the vicinity, surrounded by a high wall separating them from Nightingale Lane, near the Tower of London. These are the two establishments which of all others have cost the most to build. In 1823 a society of rich merchants applied to the British Parliament for authority to commence the works of these docks. On the ground which they proposed to use, there stood the Hospital of St. Katherine, a charitable institution, with the governors and persons of which it was necessary to treat. The result was they consented to leave it upon an indemnity of no small amount and a substitute being provided. Therefore, a building was decided on in the Eastern part of the Regent's Park. But this was not all that was required. There were about twelve hundred and fifty houses to be knocked down, and their thirteen hundred inhabitants to be provided for. The celebrated engineer Telford and Hardwick the architect undertook the work. The most difficult part of it was to excavate the hard soil for the basin and dispose of the matter, and at length it was determined to transport it to Millbank, where it was wanted to fill up an old empty reservoir. So one basin served to fill up another.

The St. Katherine docks are the only ones that a vessel can enter and leave the same day. The warehouses, supported for the most part on pillars sunk to the surface of the ground, have open galleries in which the cargoes of ships are received, and where the workmen are secured from the weather. But the real recommendations of these docks to the economist of all others, is that the system is one of perfect liberty, instead of monopoly. While the earlier establishments of the kind obliged vessels with certain merchandize to enter them, the St. Katherine's docks leave it entirely to the owners of the merchandize, and the convenience of the vessel. This last principle has always succeeded among our neighbours, for in proportion as the licences for old liberties die out, it is found that Parliament will not renew them.

Who are those miserable looking individuals in the garb of poverty in a crowd at the entrance of the London and St. Katherine's docks? Leaning about pale, and immoveable statues of hunger. Their very looks are those of uneasiness and disappointment. Poor men, they are waiting for work. The docks employ a very large number of labourers, porters, etc.; but occasionally there is even a greater pressure of work than at other times, and it is necessary then to have recourse to what are called extra hands. It is this chance of extra work on which the Bohemians of London form a group which crowds about the entrance to these docks; in fact, the dock gates seem to be the last resource of English poverty. There are assembled, from day to day and month to

month, all the victims of dissipation or ignorance, or every one in unhappy circumstances. One special trait of man, who is in such circumstances, is an inexhaustible stock of patience, no doubt essential for a person who must work for his bread.

Besides this the work of the docks has an attraction for the poor man, of whom neither address nor apprenticeship is required, but merely strong arms. But the worst of it is, and the fact has been confirmed to me, that many of them have received an education and even held a position in the world, and have not resorted to this mode of living but from having been reduced to the very lowest condition of circumstances. There is no doubt that it is the gentleman whose fall is the severest of the London poor. However, the long line of candidates at the entrance of the docks sometimes bears fruits of success. A voice calls out in the street "men wanted." These statues are in a moment alive: the whole mass at one bound are in the gate, but the want includes about a dozen only of the whole hundred candidates, for which luck of course there is a fierce contest. After the demand is arranged the rest return to their usual condition, there they are as before, and nothing discourages them. Death, sickness, imprisonment, sometimes thins their ranks, but the blanks are soon filled by others, and the specimens of starvation are always to be seen pale and poverty struck, waiting against hope for employment where the riches of the world are accumulated. But what renders these men so interesting is that they beg for work. What a contrast to see indigence obliged to be idle at the very gate of those huge establishments where navigation is incessantly heaping together all the elements of public riches.

The great attraction for the docks to be in the interior of London is naturally the great facility of depositing the merchandise on its arrival and then moving it only to its destination. This advantage is perhaps rather lessened in these days by the great facility of transport, thanks to a new agent for reducing distance. In about 1850, a petition was presented to parliament for the construction of the Victoria docks, about eight or ten miles from London, in the Plaistow Marshes, where there is a creek running into the Thames. Nature herself indeed had prepared for the work, and although these docks are on a much larger scale than those of London, the cost of their construction has been very much less. The whole capital of the company does not exceed a million sterling. To visit the Victoria dock I went by water to Blackwall, where an old craft conducted me to their entrance into the river, and the first feature that strikes one is the size of the basins. They are in fact small lakes where lie huge ships in abundance of room; for instance, the *Northumberland* herself a huge plated ship of five masts and whose battery consists of invisible guns. (One of the features of these plated ships is that she does not show the number of guns she carries; one might call them monsters which conceal their teeth. It is however quite by chance or accident and for the purpose of completing them that these ships of war remain any time in these docks, which are devoted to the interests of trade. The West India mail

steamers, large Russian ships, others laden with wood from Campechey, and other merchandize called bulky, have here plenty of room. Such are the vessels which occupy the Victoria docks, where every thing savours of the sea, but still an assemblage of birds which frequent the banks lend a kind of charm to this collection of nautical works. The pigeons apparently like to make themselves at home on the yards and spars of the vessels in the docks. The basins are surrounded with six large stone jetties which are covered by large storehouses. There are also sheds which can receive under cover a thousand tons of guano, and it is only in these docks that this compost can be received. But what is still more worthy of notice is the system of receiving and dispatching goods. A branch of the Eastern Counties Railway penetrates into the midst of these docks. The carriages come to the very sides of the basins, where steamers from sea lie with their cargoes or are ready to proceed to sea on another voyage. The transit for the merchandise in these cases is best from the steamer to the rail. This branch of the Eastern Counties communicates with every other line of the kingdom, and once landed on it, the goods proceed to their destination without leaving their waggon till they reach the end of their journey.

Another interesting scene is that of ships entering or leaving the docks. But it was the last that I was fortunate in seeing, and this was the case of two steamers, the *St. Laurence* and the *Medora*, which were going to Canada. The departure was stated on a board to take place at three o'clock. Their decks were already pretty well blocked up by merchandize, as well as men, women, and children holding, evidently with some anxiety, by the ropes stretched along fore and aft in the vessel. The steam was up, the chimney sent forth its volumes of smoke, the steam hissed, and everything seemed to be ready. The *St. Laurence* and the *Medora* were two screw vessels, but one can scarcely imagine these powerless floating masses in the confined space of the entrance to the basins, where they could not avail themselves of their power. It was necessary to haul them out by means of hawsers; all this was readily effected, and the gates were replaced, and soon the two steamers found themselves at liberty to exert their powers, and they took their course down the river under the usual waving of hats, handkerchiefs, etc.

The London, St. Katherine, and Victoria Docks have been recently united under the same company, and this is about the largest mercantile enterprise on the face of the globe. In the month of June, 1866, their capital was £9,252,549. Their affairs are managed by a court of directors who are most of them merchants, and have the same interest in forwarding the success of the docks by increasing the imports and exports. At the beginning of each year, and at the end of some, their net revenue amounts to £178,930. Their office is one of the handsomest houses in Leadenhall Street. Nothing so much as the construction of the docks has contributed to English commerce. Preserved from molestation by a high wall, and well looked after, the merchandize has been rescued from a system of pillage, accelerated

by the loading and unloading of the vessels which facilitates the classification and distribution of the merchandize. But they owe all this advantage to concentrating at the same place the terminus of the navigation, the railroad, and the electric telegraph.

Every six months the company sees the increase of their revenue. Certainly among the causes which contribute to this prosperity is that confidence for which the English are well known : their free institutions, the participation of all classes in the affairs of the state, the increase and the number of the mercantile marine, and their habit of depending only on themselves. This increase of public prosperity is without doubt a sign of maturity. A nation which, like Great Britain, depends on navigation and commerce for the elements of prosperity, requires money.

In order therefore to infuse fresh life into useful labour she has to spread information among the working classes and to reduce pauperism. But the English should know that riches are not the only index of national greatness. The rank in society in the scale of modern civilization is not measured by the amount of their imports and exports. Looking to the full condition of the docks, to all those bales of cotton on which the genius of trade and speculation may recline so easily, there is certainly no room for doubting the continued prosperity of her resources. The fear is that they will increase too much, that is in the midst of commercial opulence without parallel, she may lose sight of the interests of station for those of trade. The real power of a nation is the enlightened protection she extends to generous sentiments. Let Great Britain consult her own history, and she will herself confess that at a time when her finances were much less than at present, she held a much higher position in the councils of Europe. The sentiments of complaisance which the present state of her affairs suggests, is not this the cause of this inertness. The repose of being well off, has not this been the rock on which all commercial people have split, and for all that it is in vain we seek for peace in egotism. Among nations as well as among individuals the day will come when the mind will revenge itself on the accumulated triumphs of matter. One may measure ideas by stifling them for a moment under the effervescence of pecuniary interests, they do not ferment less in the depth of societies. Great Britain begins herself to perceive this, agitated and troubled as she is at this moment by the management of certain political matters. And whence comes the cry for war? From those same workmen who have contributed by land and sea to the production of riches. In a free state the sentiments of the dignity of man grows with the development of navigation and industry.

THE VOLCANO OF MAUNA LOA, OWHYHEE, SANDWICH ISLANDS.

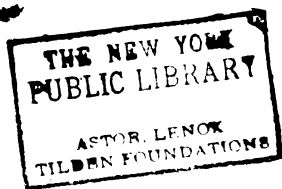
*The Eruption of January 23rd, 1859.**(Concluded from page 420, with a view. See also plan in former number.)*

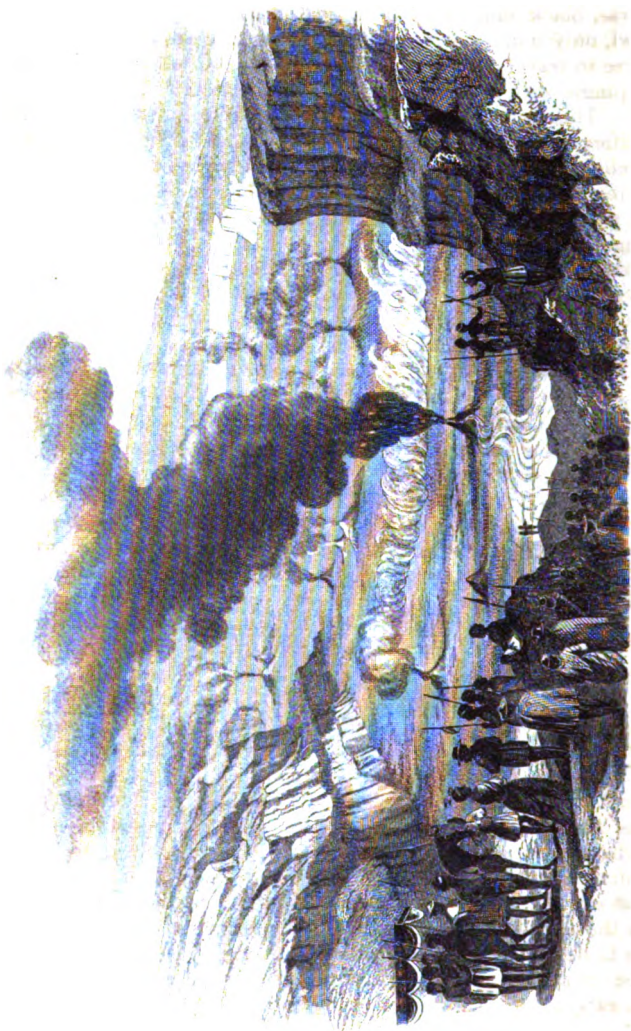
IN grandeur and beauty, no eruption within the memory of men now living can compare with the present. It differs from most previous ones in the fountain-like manner in which the lava is ejected from the crater to a height varying from two hundred to five hundred feet. It is seldom that eruptions occur combining a great flow of lava with such a lofty spouting. That of 1852 is the only exception we know of. From an account published in our papers of February 17th. by the Rev. Mr. Lyons, we quote the following description of the commencement of this eruption :

"Had I the ability, I should like to give a description of the present volcanic eruption ; but I am fearful of a failure, should the attempt be made. When one has seen the real thing itself, there is no room for the play of the imagination of poetry. You may exhaust language of its most impressive and descriptive terms, and yet fail to reach the reality. I shall attempt no more than to give a few facts. On Sabbath, January 23rd, volcanic smoke was seen gathering on Mauna Loa. In the evening the mountain presented a grand, yet fearful spectacle. Two streams of fire were issuing from two different sources, and flowing, apparently, in two different directions. The whole region, earth and heaven, were lighted up, and even the interior of our houses received the lurid volcanic light direct from its source. In the morning of the second day, we could discern where the eruptions were. One appeared to be very near the top of the mountain, but its steam and smoke soon disappeared. The other was on the north side, further below the top, and was sending out its fires in a north-westerly direction. On the second and third nights, the dense smoke and clouds prevented us from having a fair view of Pele's doings ; but on the four following nights we had a view—and such a scene ! It seemed as though the eye could never weary in gazing at it. The burning crater seemed to be constantly enlarging and throwing up its volumes of liquid fire above the mouth of the crater—I will not venture to say how high—and the fiery stream rolled onward and onward, still adding grandeur and terror as it proceeded, till on the morning of the 31st, about sunrise, the stream was compelled, though reluctantly, to stop, by meeting the waters of the ocean. Even then its resistless and opposing energy carried it on some distance into the sea."

From our account as published in the number of the *paper* we quote another description of the same :

"Our camping ground is located on the elevated table land lying between the three great mountains of Hualalai, Mauna Kea and Mauna





CRATER of MAUNA LOA
Fourteen Thousand feet above the Sea
(Sandwich Islands)

Loa, sixteen miles from Kailua, and some ten miles in an air line from the crater, which lies over against us on the side of Mauna Loa, distinctly in view. This plain is some five thousand feet above the level of the sea, and is covered with small shrubs and trees, growing from ten to twenty feet high. In some places it is level, and covered with a coarse, black sand, similar to that found on the sides of the Punch Bowl, only much coarser, while the shrubs are so sparse as to allow a horse to travel across it on a full gallop. In others it consists of a dense jungle with numerous pits or caves concealed by overgrowing shrubs. This part of the plain is almost impenetrable. In still other localities it is covered with coarse lava stones or "clinkers," over which travelling is next to impossible. The nights are extremely cold, frost covering the ground every morning. The days, are however, warm and pleasant, and the air, both night and day, is cool and invigorating.

During the day-time the light of the crater and the lava streams is hardly perceptible. The night is the time for observation. Soon after the sun had set, the molten streams began to show their courses, while the spouting of the lava from the crater became more and more distinct. The reflection of the numerous fiery streams rolling rapidly down the side of the mountain and across the plain lit up the overhanging clouds, making it as bright as moonlight for many miles around. As night advanced, and every little stream became more and more distinct, the scene was grand.

This new crater, is located on the northern slope of Mauna Loa, at an elevation of, say eight thousand five hundred feet above the sea. It is some ten or more miles westward and about four thousand feet lower down than the last eruption of 1855, known as that of Mokuaweoweo. The course of the stream, from its source to the sea, we judge to be nearly N.W. by N. The crater bears due east from Kailua by the compass, and is about twenty-four miles from that harbour in a straight line. Its latitude, as near as we are able to determine without instruments, is $19^{\circ} 37'$; longitude $155^{\circ} 49'$. By referring to a map or chart, its position on the island can readily be noted. Our figures are only estimates, and accurate observations may prove that we are in error in some of them.

The actual size and form of the crater can only be determined by visiting its immediate vicinity, which we were not prepared to do. From the distance at which we observed it, about ten miles, and from various points of observation, it *appeared* to be circular, its width being about equal to its breadth, and perhaps two hundred and fifty feet across the mouth. This may be too moderate an estimate, and it may prove to be three hundred or four hundred feet across it. The rim of the crater is surrounded or made up of cones constantly varying in extent, now growing in size and again all tumbling down. The lava does not simply run out from the side of the crater like water from the side of a bowl, but is thrown up in continuous columns, very much like Geyser springs, as represented in school geographies.

At times this spouting appeared to be feeble, rising but little above

the rim of the crater, but generally, as if eager to escape from the pent-up howels of the earth, it rose to a height nearly equal to the base of the crater. But the columns and masses of lava thrown were ever varying in form and height. Sometimes, when very active, a spire or cone of lava would shoot up like a rocket or in the form of a huge pyramid to a height nearly double the base of the crater. The mouth of the crater being about two hundred and fifty feet across, the perpendicular column must be five hundred feet in height! Then, by watching it with a spy-glass, the columns could be seen to diverge and fall in all manner of shapes, like a beautiful fountain."

This part of the scene was one of true grandeur—no words can convey a full idea of it to our readers. The molten fiery-redness, ever varying, ever changing its form, from the simple gurgling of a spring to the hugest fountain conceivable, is a scene that, only when viewed in its surpassing grandeur, will remain painted on the memory till death. Large boulders of red-hot lava stone, weighing hundreds, if not thousands, of tons, thrown up with inconceivable power high above the liquid mass, could be occasionally seen falling outside or on the rim of the crater, tumbling the cones down and rolling over the precipice, remaining brilliant for a few moments, then becoming cold and black, were lost among the mass of surrounding lava. So awfully grand, so beautiful was this ever varying scene, that the observer cannot help watching it with intense delight and increasing excitement for hours together; the only drawback being the severe cold of the night, against which travellers should be provided.

A dense heavy column of smoke continually rose out from the crater, but always on the north side, and took a north-easterly direction, rising in one continuous column far above the mountain, to a height of perhaps ten thousand feet above the crater. This smoke hovers over that island, and indeed all the islands, and must at times, when the trade wind lulls, obstruct the view. During our stay, however, it passed off from the mountain leaving the lower atmosphere quite clear. We watched closely to observe whether any *steam* could be seen issuing, either from the crater or from any of the streams of lava, but could not see anything that could be called steam or vapour, unless occasionally very slight indications along some of the lava streams. Considerable smoke rose along the stream, as the molten lava came in contact with trees and vegetable masses, but the mass of smoke came from the crater itself. Steam was noticed in various places on the plain, issuing from the rocks, and near one of the camps the heat was so intense that a tea kettle could be boiled over it. But this steam was undoubtedly caused by the heat of the flowing lava which was about a mile distant, coming in contact with pools of water in caves or pits.

On leaving the crater, the lava stream does not appear for some distance, say an eighth of a mile, as it has to cut its way through a deep ravine or gulph, eighty or one hundred feet deep, which hides it from the eye. The first then that we see of the lava after being thrown up in the crater is its branching out in streams some distance below the

fountain head. Instead of running in one large stream, it divides into a great number—perhaps as many as fifty—spreading out over a tract of five or six miles in width. For the first six miles from the crater, the descent is very rapid, and the flow of the lava varies from four to five miles an hour. But after it reaches the plain, where it is level, it moves slower. Here the streams are not so numerous as higher up, there being a principal one which varies and is very tortuous—from an eighth to a quarter of a mile in width, with frequent branches running off from it.

Some of the finest scenes of the flow were the cascades or falls formed in the stream as it flowed down the steep declivities below the crater, and before it reached the plain. There were several of them, and they appeared to be changing and new ones formed in different localities as new streams were made. One, however, which appeared without change for two days, was eighty to one hundred feet in height. First there was a fall, then below were cascades or rapids. To watch this fall during the night when the bright cherry-red stream of lava was tumbling over it at the rate of ten miles an hour, like water, was a scene not often witnessed, and never to be forgotten. In fact, the lava near its source had all the characteristics of a river of water flowing rapidly along, and gurgling with cascades, rapids, currents and falls.

On reaching the plain, where it is more level, the lava stream of course moves along more slowly and in one general stream less divided than above. The stream which had run into the sea, had apparently ceased flowing and was cooled over, so that we crossed and re-crossed it in many places, and through the fissures we could see the molten lava with its red-hot glow, an intense heat issuing out from them. In many places the surface was so hot that the soles of our shoes would have been burned had we not kept in rapid motion. The length of the lava stream from the crater to where it enters the sea at Wainanalii, is estimated to be forty miles.

On the afternoon of our arrival at the camping ground, a new stream started some few miles below the crater, which had evidently been dammed up by some obstruction, and came rushing down with tremendous noise and fury through the thick jungle which lay in its track, burning the cracking trees, and sending up a thick smoke almost as dense as that from the crater. This stream, from the time it broke away from the embankment, moved along two miles an hour till it reached the vicinity of our camp, when its progress was checked, and it moved not more than a quarter of a mile an hour. But it formed a magnificent sight. Here was a stream of lava rolling over the plain, twenty to twenty-five feet in height, and an eighth of a mile in width, though its width varied a great deal, sometimes broader, sometimes narrower. It was in fact, a mass or pile of red-hot stones, resembling a pile of coals of fire, borne along by the more liquid lava underneath. As it moved slowly along, large red boulders would roll down the sides, breaking into a thousand small stones, crushing and burning the trees, melting the rocks, and destroying everything which lay in the

track. It is impossible to give a true impression of the immense force and power of this lava stream, bearing along as it does an almost inconceivable mass. It reminds us most vividly of the breaking up of the ice in a large river, only the imagination must stretch the comparison and suppose the ice piled up twenty-five feet, and thus borne along by the current beneath, the whole width of the river moving at the same time, crashing and breaking and piling up cones and irregular masses on top. But even this comparison is far below the reality—to be conceived it must be seen.

After running a distance of about forty miles from its source, the lava stream entered the sea at a small fishing village called Wainanalii, about fifteen miles south of the port of Kawaihae, on the morning of January 31st. The eruption having commenced on the 23rd of January, it was consequently eight days in running over that distance. Of this the Rev. Mr. Lyons writes :

“ The poor inhabitants of Wainanalii, the name of the village where the fire reached the ocean, were aroused at the midnight hour by the hissing and roaring of the approaching fire, and had but just time to save themselves. Some of the houses of the inland portion of the village were partly surrounded before the inmates were aware of their danger. Wainanalii is near the northern boundary of North Kona, and about twelve or fourteen miles from Kawaihae. It is, of course, all destroyed, and its pleasant little harbour all filled up with lava. The volcanic stream was one mile wide or more in some places, and much less in others. It crossed the Kona road interrupting the mail communication. The whole distance of the flow from the crater to the sea is some forty miles.”

The schooner *Kekauluohi* was passing this village at the time the stream reached the sea, and several foreigners on board have described the scene as one of terrific grandeur. Perhaps we cannot give a better account of it than to insert here the description given of the meeting of the lava stream with the sea in the eruption of 1840 :

“ When the torrent of fire precipitated itself into the ocean, the scene assumed a character of terrific and indescribable grandeur. The magnificence of destruction was never more perceptibly displayed than when these antagonistic elements met in deadly strife. The mightiest of earth's magazines of fire poured forth its burning billows to meet the mightiest of oceans. For two-score miles it came rolling, tumbling, swelling forward, an awful agent of death. Rocks melted like wax in its path ; forests crackled and blazed before its fervent heat ; the very hills were lifted from their primeval beds, and sank beneath its tide, or were borne onward by its waves ; the works of man were to it but as a scroll in the flames ; Nature shrivelled and trembled before the irresistible flow. Imagine Niagara's stream, above the brink of the falls, with its dashing, whirling, madly raging and hurrying on their plunge, instantaneously converted into fire, a gory-hued river of fused minerals ; the wrecks of creative matter blazing and disappearing beneath its surface ; volumes of hissing steam arising ; smoke curling upwards from ten thousand vents, which give

utterance to as many deep-toned mutterings, and sullen, confined, and ominous clamourings, as if the spirits of fallen demons were struggling against their final doom; gases detonating and shrieking as they burst from their hot prison-house; the heavens lurid with flame; the atmosphere dark, turgid and oppressive; the horizon murky with vapours, and gleaming with the reflected contest; while cave and hollow, as the hot air swept along their heated walls, threw back the unearthly sounds, in a myriad of prolonged echoes. Such was the scene as the fiery cataract, leaping a precipice of fifty feet, poured its flood upon the ocean. The old line of coast, a mass of compact, indurated lava, whitened, cracked, and fell. The waters recoiled, and sent forth a tempest of spray; they foamed and lashed around and over the melted rock; they boiled with the heat, and the roar of the conflicting agencies grew fiercer and louder. The reports of the exploding gases were distinctly heard twenty-five miles distant. They were likened to discharges of whole broadsides of heavy artillery. Streaks of the intensest light glanced like lightning in all directions; the outskirts of the burning lava as it fell, cooled by the shock, was shattered into millions of fragments, and, borne aloft by strong breezes blowing towards the land, were scattered in scintillant showers far into the country. For three successive weeks, the volcano disgorged an uninterrupted burning tide, with scarcely any diminution into the ocean. On either side, for twenty miles, the sea became heated, and with such rapidity, that on the second day of the junction fishes came ashore dead in great numbers at Keaau, fifteen miles distant. Six weeks later, at the base of the hills, the water continued scalding hot, and sent forth steam at every wash of the waves.

PROF. ALEXANDER'S ACCOUNT.

At a time when all information relating to the eruption is eagerly received, a brief sketch of what the company to which I belonged, saw and did, may be interesting to your readers, particularly as we reached the source by a route different from that taken by any other party, excepting perhaps Mr. Vaudry. Our party sailed from Honolulu in the *Kinoole*, on Tuesday, February 1st, and landed at Kealakekua Thursday noon. During the preceding night we had a distant view of the eruption, like a star, two-thirds up the mountain, with streaks of light branching out from below. Friday was spent in preparations for the jaunt, and on Saturday morning we set out for the crater, from Kuapehu, in a direction nearly east. * * *

As we began to emerge from the woods we had a fine view of the jet, playing at a distance of perhaps twenty-five miles, to the height, as we afterwards estimated, of three hundred feet. It was of a deep red colour, in form and movement exactly like a fountain, and was accompanied by immense columns of steam. It was soon concealed from our view, however, by the flanks of Mauna Loa. About twelve miles from the coast road we reached a watering place called Waiio, which we found nearly dry.

Here we were obliged to send back our horses and pack oxen and proceed on foot. Our guides then led us in a direction about E.S.E. across a rugged tract of clinkers to a cave, eight miles from Waio, where we encamped for the night. This cave had formed part of the channel of a subterranean stream, which left a series of deep caverns, fissures and pits to mark its course. * * *

During the afternoon, the party, being in want of water, pushed on six or eight miles S.S.E. to a well known watering place called Puapuawai, where they encamped. At this point the cold was so intense at night, that a crust of ice half an inch thick was formed in our calabashes, and the berries around our camp were frozen hard. As far as we could judge by the horizon, we were about a thousand feet lower than the summit of Hualalai, and accordingly, eight thousand feet above the sea. On account of the failure of this spring, as well as for other reasons, it was thought expedient to divide the party. Half of them, headed by President Beckwith, returned to Kaawaloa, and went out to the lava flow by Governor Adams' road.

The advanced party started again directly for the crater on Wednesday morning, consisting of twelve white men and thirty kanakas, with a week's provisions. During this day's march the rarity of the atmosphere affected us all more or less, but especially our natives, who seemed unable to carry their usual loads. We were slowly ascending nearly all day. The vegetation became more and more scanty, till it almost entirely disappeared.

About noon we crossed a recent flow, perhaps that of 1847, and at four p.m. (February 9th), after a march of about twenty miles N.E., we suddenly found the two active craters, and the lava stream in its whole extent, immediately below us. We encamped a mile and a half S.W. of the larger cone, on an eminence commanding a fine view of the whole eruption. Large banks of snow and ice were found within a quarter of a mile from our camp, so that all anxiety on the score of water was soon dissipated.

The sight which we enjoyed that night will not be forgotten by any of the party. The jet had ceased to play, but the two craters were blowing off enormous columns of steam, and showers of red-hot scoria, with a noise like that of heavy surf, or occasionally like discharges of artillery. Half a mile below the lower crater appeared a cataract of fire, continued for several miles in a winding river of light, which then divided into a net work of branches, enclosing numerous islands. The branch towards Kawaihae still gave a dull red light in a few spots, but the force of the stream seemed to be directed west towards Kona.

Two new streams seemed to be running a race, as it were, in that direction, and we could see the forest blazing before them. The next day (10th) was rainy, and the fog so dense that we could not travel. We moved down a couple of miles, and encamped on the fresh lava stream, half a mile south of the principal cone. By the heat of the steam cracks we boiled our coffee, roasted meat and potatoes, and melted the snow, which our natives had brought down in sacks, till we

filled all our water containers. During the day parties explored the craters.

The two principal cones are about a quarter of a mile apart, the upper one bearing S.E. from the other. They are about 150 feet high, and are composed entirely of pumice and small fragments of lava which were thrown out in a liquid state. The upper cone was a closed crater, enclosing two red-hot vent holes or furnaces, several feet in diameter, from which it was emitting steam and sulphurous gas, and now and then showers of light pumice. The suffocating gases rendered it impossible to approach it except on the windward side. The lower crater, from which the great get had been playing two days before, was somewhat larger, and a great gap was left open on the lower side, through which a torrent of lava had flown down the slope.

We found a third crater, above the two we have mentioned, which was still smoking, and in fact we could trace a line of fresh lava and scoria cones two or three miles farther up the mountain. The larger cones were in the center of a still smoking stream, a mile wide, which must have flown from a source considerably higher up.

It was a subject of regret to the party that they did not have a barometer to measure the elevation of the source, but, taking all things into account, we think it cannot be less than 8000 feet, and is probably nearer 10,000 feet above the sea. The elevation of the "heiau of Umi" is given by Wilkes at 5000 feet, and we think the source of the eruptions is certainly 3000 or 4000 feet higher.

We slept on the warm lava that night, and early next morning revisited the lower crater, and followed the central flow for half a mile, passing two or three small cones, till we reached the present outlet, to which the stream evidently had found its way from the crater by a subterranean channel. It was in appearance like a pool of blood, a few rods in width, boiling up like a spring, and spouting up thick, clotted masses to the height of ten or twenty feet. One of our party approached near enough to run his pole into it. On the other side it poured in a cataract of molten metal at a white heat, down a descent of about fifty feet, with a roar like that of heavy surf. A strong south wind was blowing, which enabled us, by holding our hats before our faces, to get within a few feet of the brink. The lava appeared almost as fluid as water, and ran with a velocity which the eye could scarcely follow. The solid fragments which now and then fell in torrents disappeared almost instantly. For several miles the fiery river was a continuous series of rapids and cataracts. At length we reluctantly returned to our camp, a distance of two or three miles across the fresh lava, which in several places was hot enough to burn our sandals.

After taking our breakfast, and starting our natives over the old "pahoe-hoe" along the south bank of the stream, we returned to the great cataract. The action had greatly increased during the last three hours; the pool had become a fountain, playing to the height of thirty feet, and the falling pieces were fast forming a crater around it, the rim of which was already ten feet high, but open on the lower side to

form an outlet to the torrent. Two smaller jets were playing above it, which will probably unite with it to form one crater. The upper one threw up light pieces of pumice to the height of sixty feet, and was forming a very regular cone.

It was fortunately a clear day on the mountain, and a strong wind was blowing from the southwest, so that we travelled for three or four hours along the very brink of the stream, without inconvenience. It had worn for itself a deep, well-defined channel, so that there was no danger of any sudden change in its course. The channel in which it ran varied from twenty to fifty feet in width, and was ten to fifteen feet deep. But the stream was in reality much wider than this, for the banks on either side were undermined to a considerable distance. Often we met with openings in the crust, through which we could see the rushing torrents a few feet or even inches below our feet.

To describe the scene is impossible. No epithets in the English language are adequate to the task. For the first time we saw actual *waves* and actual *spray* of liquid lava. As its surges rolled back from the enclosing walls of rock, they curled over and broke like combers on the reef. Its forms, however, were bolder and more picturesque than those of running water, on account of its being a heavier and more tenacious fluid.

There was besides, an endless variety in its forms. Now we passed a cascade, then a whirlpool, then a smooth, majestic river, then a series of rapids, tossing their waves like sea; now rolling into lurid caverns, the roofs of which were hung with red-hot stalactites, and then under arches which it had thrown over itself in sportive triumph. The safety with which it could be approached was matter of astonishment to us all.

After following it six or eight miles, we halted for dinner on an island, about a quarter of a mile from the largest fall, and then proceeded down the stream till four p.m. As the descent became more gradual the torrent changed its colour, first to rose-colour, then to a dark blood-red; its surface began to gather a greyish scum, and large drifting masses became frequent. It now began to separate into numerous branches, and it became more unsafe to follow the central stream, as changes were constantly taking place, and our retreat was liable to be cut off at any moment. We therefore kept nearer the edge of the flow, and at length encamped on an island in the woods. During the night the craters were very active, and the whole plain seemed to be on fire below around us.

The party were called out by four o'clock the next morning, and went up a short distance to observe a new stream which was pouring down through the woods to our camp. It was a shallow flow in a high state of fusion, and was forming smooth "pahoehoe." Its mode of advance through the woods, girdling and slowly consuming the trees, the surface constantly cooling over and breaking up by turns, was exactly the same as that observed at Hilo, and needs no description. Here we were able to take out as many specimens in a liquid state as we wished, to insert coins into them, and if we had carried moulds with us, we might have forced the liquid into almost any

required shape. We spent the forenoon in following the stream to the plain, partly crossing it in some places to reach the scene of a new overflow. We had been particularly curious to see how clinkers are formed, and our curiosity was now gratified. The difference between "pahoe-hoe" or smooth lava, and "aa" or clinkers, seems to be due more to a difference in their mode of cooling than to any other cause. The streams which form the "pahoe-hoe" are comparatively shallow, in a state of complete fusion, and cool suddenly in a mass. The "aa" streams, on the other hand, are deep, sometimes moving along in a mass twenty feet high, with solid walls; they are less fluid, being full of solid points, or centres of cooling, as they may be called, and advance very slowly. That is, in cooling, the "aa" stream *grains* like sugar.

March 7th, 1859.

In the dearth of more exciting news, the volcano continues to be an object of interest, and a few lines of later date than those previously published may be acceptable to your readers.

I started on foot for the scene of the eruption on Wednesday, the 16th ultimo, from the house of Mr. W. Johnson, of Kona, accompanied by three natives in the capacity of guides and carriers. We arrived at the Heiau of Umi before dark, and passed the night in a cave, the entrance of which commanded a fine view of the fiery rivers that were rushing down the mountain side and spreading over the plain. In the morning we arose early, and after filling our water vessels at a neighbouring spring, directed our course towards the great column of smoke that rose like a beacon from the upper crater at a distance of from twenty to twenty-five miles. Our route lay for a short distance through thick woods and shrubbery. We then emerged on to the solid *pahoe-hoe*, which is on the lower part of the slope, adorned with ohia trees and richly laden ohelo bushes, and found excellent walking until we reached the immediate vicinity of the crater. We arrived at the upper crater on Friday noon, after an easy journey of two days and a half from the time of leaving Mr Johnson's. A good walker, unencumbered with baggage, might accomplish the distance in half the time.

The height of this crater, as nearly as I could estimate from the apparent elevation of the horizon above the summit of Mount Hualalai, is as much as nine thousand five hundred feet.

We chose for our camp the same site which had been previously occupied by Mr. Alexander's party, and were so fortunate as to find there a calabash full of water, cool and limpid, saving us an anticipated ascent to the snow for supplies; and we cooked our mutton and baked our kalo cakes in the same hot air holes that had proved so useful to them before. The air from some of the crevices was heated to so high a temperature that a piece of paper or a dry stick placed within it at the surface of the ground ignited immediately.

From the camp was visible at night, one of the most magnificent

spectacles that the imagination can conceive. The evening was clear and starlight, and afforded us a complete view of the flowing lava. A river of lava issuing from the lower, and smaller of the three craters there in action (probably the one in process of formation at the time of Mr. Alexander's visit) separated into two streams a short distance below, and these, after running side by side for several miles, re-united and descended the declivity in a common flood, throwing off towards the plain to the southward in their course fifteen or twenty smaller streams of lava, some of them miles in length, and all meandering hither and thither, and intersecting one with another, so that the whole slope of the mountain, for the distance of a day's journey, and a width in some places of three or four miles, presented the appearance of shining rose coloured lace work. In the foreground were the two larger active craters which, although they had ceased to spout forth lava and scoria, still threw up flames, and from which arose immense pillars of smoke and cloud, looking, in the red reflection from within, like columns of living fire, reaching to the zenith, and forming a majestic termination to the brilliant arch of fiery cloud which, floating above the lava stream, covered one-half the blue dome from the sea to the crater.

At a distance it looks like an immense mass of half red-hot cinders and slag from a foundry, rolling along over and over itself, impelled by an irresistible power from behind and beneath. That power is the liquid stream, almost concealed by the pile of cinders, which has been formed from itself in cooling. We heard frequent explosions, caused by the lava penetrating caves and blowing them up. The principal stream of running lava which we saw on the plain, was three or four miles S.E. of the extremity of the Judd Road, and was moving west by north. At this point we left the lava stream, and descended to Umi's temple by a short cut, through an open forest of "pahoehoe." We reached the heiau about three p.m., and arrived at Mr. Johnson's about eight o'clock the same evening. The other division of our party had already visited the flow by way of Governor Adams's road and had returned. We sailed again from Keauhou the following Tuesday, and arrived in Honolulu on Sunday morning.

Profiting by the favour of a strong sea-breeze, I succeeded in descending a short distance, perhaps twenty feet, into the upper active crater to a small projecting ledge, but a sudden whirl of the wind, threatening me with suffocation, obliged me to retreat again in double quick time. This crater had changed materially in appearance since the visit of the previous party. Instead of the comparatively small blow-hole, there was now a deep chasm or rift, some eighty feet in depth, and ten in width, between whose red-hot walls a great volume of steam ascended, allowing only an occasional glimpse at the region beneath. At intervals, however, when an obliging puff of wind thinned for an instant the vaporious mass, I could distinguish below a stream of incandescent lava rushing forth from the mountain side with almost incredible velocity. Before leaving the crater the chasm was again covered, and the river ran beneath the crust until it again

emerged at the other crater, a quarter of a mile below. We are unable to explore the interior of this crater. It seemed, however, to possess more action than the upper one. Upon leaving it, the stream once more passed under ground and finally emerged again for the last time at the lower and smaller crater.

During our visit at the lava flow, we were not so fortunate as to witness the formation of the "aa" or clinker beds, which is said to be the most interesting of all the lava formations. The force of the lava was distributed entirely among numerous shallow flows of "pahoe-hoe," extending slowly into the plain, cutting down trees and bushes, and spreading desolation everywhere in its path. One can imagine no more perfect embodiment of desolation than the old track of a lava flow. The slow march is accompanied, when the lava is flowing over a surface of old "pahoe-hoe," by constantly recurring reports caused by the blowing up of cavities sometimes at a distance of one hundred and fifty yards from the stream. Large rocks are sometimes thrown to a great height by these explosions, and the reports have been heard in the night as far as Mr. Johnson's house,—a distance of twenty-five or thirty miles.

The lava had approached to within an hour's walk of the heiau at the time of our leaving the scene of action. There had probably been little or no diminution in the quantity of molten matter poured forth from the mountain side, and there appeared to be every prospect of its continuing many months.

On the evenings of the 26th and 27th of February, being the last two nights before my departure from Kona, an unusually bright reflection was visible in the direction of the lava stream—affording ground for the belief that a new fountain had burst forth. The light was similar to that observed some weeks previously at the time of the great jets, which have been estimated variously at from two hundred and sixty to five hundred feet in height.

Parties going to the volcano should carry plenty of blankets, and go prepared for rainy weather. If they are good pedestrians they had better go on foot. The Governor Adams' road is in good condition, and though longer, is, unless in very dry weather, preferable to the Dr. Judd road. People who wish to see all that is to be seen, should pass at least a week among the mountains. If the party is small, comfortable shelter can be found in caves, and tents will be a useless incumbrance. In conclusion, I would express my grateful sense of the kind hospitality experienced at the hands of Mr. William Johnson and Mr. Thomas H. Paris, during my stay in Kona.

The following extract shews the state of the volcano in June last :

"The volcano is lively, and having fine times. No less than eleven fires are burning. In different places about the bank, where the road goes down, the lava has flowed up sixty feet and cooled over. Your feet will be so hot after crossing, that if you should spit on your toenails they would hiss, like hot iron ! But in the neighbourhood of the crater there are strawberries galore, large and luscious, besides ohelos."

THE MERCHANT SHIPPING ACT, 1867.

Be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same as follows :

1. This Act may be cited as The Merchant Shipping Act, 1867, and shall be construed with and as part of the Merchant Shipping Act, 1854, hereinafter termed the Principal Act.

COMMENCEMENT OF ACT.

2. This Act shall come into operation on the first day of January, 1868, but shall not apply to any ship which belongs to the United Kingdom and is absent therefrom at the time of the passing of this Act until such ship has returned to the United Kingdom.

ACTS REPEALED.

3. The 224th, 227th, and 231st sections of the principal Act are hereby repealed.

LIME OR LEMON JUICE AND OTHER ANTI-SCORBUTICS TO BE PROVIDED.

4. The following rules shall be observed with respect to medicines, medical stores, and anti-scorbutics (that is to say) :—

(1.) The Board of Trade shall from time to time issue and cause to be published scales of medicine and medical stores suitable for different ships and voyages, and shall also prepare or sanction a book or books containing instructions for dispensing the same.

(2.) The owners of every ship navigating between the United Kingdom any place out of the same shall provide and cause to be kept on board such ship a supply of medicines and medical stores in accordance with the scale appropriate to the said ship, and also a copy of the said book or of one of the said books containing instructions.

(3.) No lime or lemon juice shall be deemed fit and proper to be taken on board any such ship, for the use of the crew or passengers thereof, unless the same has been obtained from a bonded warehouse for and to be shipped as stores ; and no lime or lemon juice shall be so obtained or delivered from any warehouse as aforesaid unless the same is shown, by a certificate under the hand of an Inspector appointed by the Board of Trade, to be proper for use on board ship, such certificate to be given upon inspection of a sample after deposit of the said lime or lemon juice in the warehouse ; nor unless the same contains fifteen per centum of proper and palatable proof spirits, to be approved by such Inspector, or by the proper Officer of the Customs, and to be added before or immediately after the inspection thereof ;

nor unless the same is packed in such bottles, at such time and in such manner as the Commissioners of Customs may direct; provided that when any such lime or lemon juice is deposited in any bonded warehouse, and has been approved as aforesaid by the said Inspector, the said spirits, or so much of the said spirits as is necessary to make up fifteen per centum may be added in such warehouse; and when any spirit has been added to any lime or lemon juice, and the same has been labelled as aforesaid, it shall be deposited in the warehouse for delivery as ship's stores only, upon such terms and subject to such regulations of the Commissioners of Customs as are applicable to the delivery of ship's stores from the warehouse.

(4.) The master or owner of every such foreign-going ship (except those bound to European ports or to ports in the Mediterranean Sea, and also except such ships or classes of ships bound to ports on the Eastern coast of America north of the thirty-fifth degree of north latitude, and to any islands or places in the Atlantic Ocean north of the same limit, as the Board of Trade may from time to time exempt from this enactment) shall provide and cause to be kept on board such ship a sufficient quantity of lime or lemon juice from the warehouse duly labelled as aforesaid, such labels to remain intact until twenty-four hours at least after such ship shall have left her port of departure on her foreign voyage, or a sufficient quantity of such other anti-scorbutics, if any, of such quality, and composed of such materials, and packed and kept in such manner, as her Majesty by Order in Council may from time to time direct.

(5.) The master of every such ship as last aforesaid shall serve or cause to be served out the lime or lemon juice with sugar (such sugar to be in addition to any sugar required by the articles) or other anti-scorbutics as aforesaid to the crew so soon as they have been at sea for ten days, and during the remainder of the voyage, except during such time as they are in harbour and are there supplied with fresh provisions; the lime or lemon juice and sugar to be served out daily at the rate of an ounce each per day to each member of the crew, and to be mixed with a due proportion of water before being served out, or the other anti-scorbutics, if any, at such times and in such quantities as her Majesty by Order in Council may from time to time direct.

(6.) If at any time when such lime or lemon juice or anti-scorbutics is or are so served out as aforesaid any seaman or apprentice refuses or neglects to take the same, such neglect or refusal shall be entered in the official log-book in the manner provided by the 281st section of the principal Act, and shall be signed by the master and by the mate or some other of the crew, and also by the surgeon or medical practitioner on board, if any:

And if in any such ship as aforesaid such medicines, medical stores, book of instructions, lime or lemon juice, sugar, or anti-scorbutics as are hereinbefore required are not provided, packed, and kept on board as hereinbefore required, the owner or master shall be deemed to be in fault, and shall for each default incur a penalty not exceeding £20, unless he can prove that the non-compliance with the above provisions,

or any of them, was not caused through any inattention, neglect, or wilful default on his part; and if the lime or lemon juice and sugar or other anti-scorbutics are not served out in the case and manner hereinbefore directed, or if entry is not made in the official log in the case and manner hereinbefore required, the master shall be deemed to be in fault, and shall for each default incur a penalty not exceeding £5, unless he can prove that the non-compliance with the above provisions, or any of them, did not arise through any neglect, omission, or wilful default on his part; and if in any case it is proved that some person other than the master or owner is in default in any case under this section, then such other person shall be liable to a penalty not exceeding £20.

PENALTY FOR SELLING, ETC., MEDICINES, ETC., OF BAD QUALITY.

5. Any person who manufactures, sells, or keeps or offers for sale any such medicines or medical stores, as aforesaid, which are of bad quality, shall, for each such offence, incur a penalty not exceeding £20.

INSPECTION ABROAD.

6. In any British possession out of the United Kingdom, the governor or officer administering the government for the time being shall, subject to the laws of such possession, have power to make regulations concerning the supply within such possession, of lime or lemon juice and anti-scorbutics for the use of ships; and any lime or lemon juice or anti-scorbutics duly supplied in accordance with any such regulations shall be deemed to be fit and proper for the use of ships.

SEAMEN'S EXPENSES IN ILLNESS.

7. Whenever it is shown that any seaman or apprentice who is ill has, through the neglect of the master or owner, not been provided with proper food and water according to his agreement, or with such accommodation, medicines, medical stores, or anti-scorbutics as are required by the principal Act or by this Act, then, unless it can be shown that the illness has been produced by other causes, the owner or master shall be liable to pay all expenses properly and necessarily incurred by reason of such illness (not exceeding in the whole three months' wages), either by such seaman himself, or by Her Majesty's Government, or any officer of Her Majesty's Government or by any parochial or other local authority on his behalf, and such expenses may be recovered in the same way as if they were wages duly earned; provided, that this enactment shall not operate so as to affect any further liability of any such owner or master for such neglect, or any remedy which any seaman already possesses.

FORFEITURE OF WAGES, ETC.

8. Where a seaman is, by reason of illness, incapable of performing his duty, and it is proved that such illness has been caused by his own wilful act or default, he shall not be entitled to wages for the time during which he is by reason of such illness incapable of performing his duty.

PLACE APPROPRIATED TO SEAMEN.

9. The following rules shall be observed with respect to accommodation on board British ships (that is to say) :—

(1.) Every place in any ship occupied by seamen or apprentices, and appropriated to their use, shall have for every such seaman or apprentice a space of not less than seventy-two cubic feet, and of not less than twelve superficial feet, measured on the deck or floor of such place.

(2.) Every such place shall be such as to make the space aforesaid available for the proper accommodation of the men who are to occupy it, shall be securely constructed, properly lighted and ventilated, properly protected from weather and sea, and as far as practicable properly shut off and protected from effluvium which may be caused by cargo or bilge water.

(3.) No such place as aforesaid shall be deemed to be such as to authorise a deduction from registered tonnage, under the provisions hereinafter contained, unless there is or are in the ship one or more properly constructed privy or privies for the use of the crew; such privy or privies to be of such number and of such construction as may be approved by the surveyor hereinafter mentioned.

(4.) Every such place shall, whenever the ship is registered or re-registered, be inspected by one of the surveyors appointed by the Board of Trade under Part IV. of the principal Act, who shall, if satisfied that the same is in all respects such as is required by this Act, give to the collector of customs a certificate to that effect, and thereupon such space shall be deducted from the register tonnage.

(5.) No such deduction from tonnage as aforesaid shall be authorised unless there is permanently cut in a beam and cut in or painted on or over the doorway or hatchway of every such place the number of men which it is constructed to accommodate, with the words "certified to accommodate seamen."

(6.) Every such place shall be kept free from stores or goods of any kind, not being the personal property of the crew in use during the voyage.

(7.) Upon any complaint concerning any such place as aforesaid, one of the surveyors appointed by the Board of Trade may inspect such place, and if he finds that any provisions of this Act with respect to the same are not complied with he shall report the same to the collector of customs at the port where the ship is registered, and thereupon the registered tonnage shall be altered, and the deductions

aforesaid in respect of space disallowed, unless and until it shall be certified by such surveyor, or by some other surveyor appointed by the Board of Trade, that the provisions of the Act in respect of such place are fully complied with.

(8.) If any such place in any ship is not kept free from goods and stores as aforesaid, the Master shall be deemed to be in fault, and shall for every such failure to comply with the provisions of this section forfeit and pay to each seaman lodged in such place the sum of one shilling a day for each day after complaint made to him by any two or more of such seamen during which any goods or stores, not being the personal property of the crew, are stored or kept therein.

(9.) If in any other respect the provisions of this section are not observed with respect to any such place in any ship the owner shall be deemed to be in fault, and shall for every failure to comply with the provisions of this section incur a penalty not exceeding twenty pounds.

RULES FOR MEDICAL INSPECTION OF SEAMEN.

10. The following rules shall be observed with respect to the medical inspection of seamen (that is to say):—

(1.) At any port where there is a Local Marine Board, the Local Marine Board, and at any other ports in the United Kingdom, the Board of Trade, may appoint a Medical Inspector of seamen.

(2.) Such Medical Inspector of seamen shall, on application by the owner or master of any ship, examine any seaman applying for employment in such ship, and shall give to the superintendent of the Mercantile office a report under his hand stating whether such seaman is in a fit state for duty at sea, and a copy of such report shall be given to the master or owner of the ship.

(3.) The master or owner applying for such inspection shall pay the superintendent such fees as the Board of Trade direct, and such fees shall be paid into and form part of the Mercantile Marine Fund.

(4.) The said Medical Inspectors shall be remunerated for their services as the Board of Trade may direct, and such remuneration shall be paid out of the Mercantile Marine Fund.

(5.) In British possessions out of the United Kingdom the Governor or other officer administering the government for the time being shall have the power of appointing Medical Inspectors of seamen, of charging fees for inspections, when applied for, and of determining the remuneration to be paid to such Inspectors.

OFFENCES BY BRITISH SUBJECTS ON FOREIGN SHIPS.

11. If any British subject commits any crime or offence on board any British ship, or on board any foreign ship to which he does not belong, any court of justice in her Majesty's dominions, which would have had cognisance of such crime or offence if committed on board a British ship within the limits of its ordinary jurisdiction, shall have jurisdiction, to hear and determine the case as if the said crime or offence had been committed as last aforesaid.

HOLYHEAD HARBOUR-MASTER MAY BE COMMISSIONED AS JUSTICE.

12. The harbour-master for the time being of the harbour of Holyhead, in the event of its seeming meet to her Majesty to assign to him her Majesty's Commission to act as a justice of the Peace within the limits within which he is empowered to act in harbour matters, shall, during the continuance of such assignment and of his tenure of the office of harbour-master, execute within such limits the duties of a justice of the peace, notwithstanding he may not be qualified by estate to be a justice of the peace for a county, and shall have within such limits the same power and jurisdiction as a stipendiary magistrate has by Act of Parliament when sitting at a police court or other place appointed in that behalf.

SUMNER'S METHOD—*improved on.*

We have received the following very useful problem from the Naval Instructor of H.M.S. *Britannia* at Dartmouth.—The great importance of it will be at once evident to the experienced navigator.

The valuable Rule known as "Sumner's Method" is in favour with Navigators on account of its extreme simplicity. The following, which is founded on similar principles, is worthy of notice on account of its conciseness, being only about half the length of an ordinary "Sumner's."

Problem :—To lay down two positions on a chart, and by bearings of a ship from them to ascertain its latitude and longitude.

Rule :—Take two chronometer observations, at any time from noon, provided that the sun is not nearer the meridian at either observation than about two points, and that the intervals between the bearings is not less than about the same. Correct the second altitude for sun in usual way, and work both chronometers with the latitude by dead reckoning at the second observation; then if the two observations agree, they give the true longitude, and show the latitude used to be correct; but if they do not agree, lay off each position on a chart, and draw through it a line showing the sun's bearing at the time of observation, and another at right angles to the same; the point of intersection of the two latter will be the position of the ship. The bearings may be taken from Broadwood's Azimuth Tables, or from that at page 10, Inman's Tables (New Ed.), or, under favourable circumstances, they may be found with sufficient accuracy by correcting the sun's bearing by Azimuth compass for Variation and Deviation in the usual way.

EXAMPLE.

In lat. D.R. 50° N., when the bearings were N. 60° E., and N. 85° E., observations were taken, and the longitudes deduced from these were, (1) $40^{\circ} 18'$ W., and (2) $40^{\circ} 40'$ W.: find the ship's position at the second observation.

On the parallel of 50° N., lay off longitudes (1) and (2): through (1) draw a line in the direction of N. 60° E., and through (2) another in the direction of N. 85° E.; also through (1) and (2) draw lines at right angles to the former: they will be found to intersect in latitude $50^{\circ} 29'$ N., and longitude $40^{\circ} 44'$ W., which accordingly is the position of the ship.

If there be no Azimuth Tables at hand, both the time and bearing may be found from the same observation, as in the following

EXAMPLE.

Given:—Sun's alt. $9^{\circ} 14'$ (East of Mer.) Dec. $7^{\circ} 6'$ S., Lat. $53^{\circ} 30'$ N.; to find the apparent time, and azimuth.

Zen dist.	80°	46
Pol. dist.	97	6
Co. lat.	36	30

2)214 22

Half sum	107	11	cosec.	10	01983	
1st remr.	26	25	cosec.	10	85174	} — 19 59497
2nd remr.	10	5	sine.	9	24323	
3rd remr.	70	41	sine.	9	97484	

2)19 58964

$$\tan \frac{T}{2} = 9 \ 79482 \quad - \quad 9 \ 79482$$

$$\tan \frac{A}{2} = 9 \ 80015$$

$$\frac{T}{2} = \begin{array}{r} \text{h. m. s.} \\ 2 \quad 7 \quad 46 \\ \hline 2 \end{array}$$

$$\frac{4 \ 15 \ 32}{24}$$

$$\text{Apparent time} \quad \underline{19 \ 44 \ 28}$$

$$\frac{A}{2} = \begin{array}{r} 82^{\circ} \ 15' \\ \hline 2 \end{array}$$

$$\text{Az. S. } \underline{64 \ 30 \ \text{E.}}$$

NOTES.

1. The Zenith dist. must always be written down *first*.
2. If the time P.M. be required, proceed as before, only do not subtract from 24 hours.
3. The Azimuth is to be marked S. in North latitude, and N. in South latitude, and E. or W. according as the Sun is East or West of Meridian.
4. The bearings should be laid off with a good protractor.
5. The more nearly the bearings are at right angles to each other, the more reliable will be the results.
6. From either of the observations the variation of the compass may be obtained.

H.M.S. *Britannia*, Dartmouth,
14th August, 1867.

A. C. JOHNSON,
Naval Instructor.

ROYAL NATIONAL LIFEBOAT INSTITUTION.

At the meeting on the 1st of August, a reward of £13 4s. was voted to pay the expenses of the institution's lifeboat at Exmouth, in putting off on the 13th of July, in a strong gale of wind, with a view of rendering assistance to the crew of the brig *Ranger*, of Newcastle, which was totally wrecked off Budleigh Salterton. The lifeboat in crossing the bar, where a heavy sea was breaking, was repeatedly filled with water, and had four of her oars broken. She, however, behaved very well under these circumstances; but while the boat was on her way to the wrecked vessel, the crew were rescued by means of the rocket apparatus, and the lifeboat was thereupon signalled to return to her station.

Rewards amounting to £34 were also granted to the crews of the society's lifeboats at Fraserburgh, Arklow, Cromer, and Teignmouth, for various services during recent heavy gales. A reward was likewise voted to Mr. Curran, for swimming off at the risk of his life, in a heavy surf, and assisting to bring ashore the crew of nine men of a shore-boat which had capsized off Meenacladdy, Ireland, on the 25th June. A reward of £9 10s. was likewise voted to the crew of a Pakefield yawl, for rescuing on the 16th July, in a strong wind and heavy sea, the crew of six men of the French lugger *Edouard et Rose*, which had sunk on the Newcombe Sand, Suffolk. Other rewards were also granted for saving life from different wrecks on our coasts. It was reported that the institution had recently forwarded new lifeboats to Llandudno (Wales) and Sheringham (Norfolk).

The railway companies had, as usual, kindly given a free conveyance to the boats. It was also stated that the late Jacob Nathan, Esq., of Plymouth, had bequeathed £50 to the institution. Legacies had also been received from the executors of the late Miss Caroline N. Oxenham, of Kensington (less duty), £180, and the late Mr. Edwin Bagshaw, of Nottingham, £25. Titus Salt, Esq., of Bradford, had presented to the institution £620 to pay for an additional lifeboat station. £300 had also been received from *Routledge's Magazine* for Boys' Lifeboat Fund, to defray the cost of the surf lifeboat now being built for Caister, Norfolk, the amount of which had been principally raised through the zealous exertions of Edmund Routledge, Esq., the editor of this very instructive periodical. £8 16s. 6d. had also been contributed to the institution by the officers and passengers on board the Cape mail steamers, *Roman* and *Anglian*, on their last passages from the Cape of Good Hope, through the respective commanders, Captain Walter Dixon and Lieutenant R. W. Ker, R.N.R. Payments amounting to £1,486 were ordered to be made on various lifeboat establishments. New lifeboat houses were ordered to be built at Kessingland in Suffolk, Cadgwith in Cornwall, and Bembridge in the Isle of Wight. Reports were read from the Inspector and Assistant Inspector of Lifeboats to the society on their recent visits to some of the lifeboat stations on the coast. The proceedings then terminated.

NOTES OF NOVELTIES.

AMONG the novelties of the present month the most important are in the way of Docks abroad : Malta and Hong Kong, two important places, have had these valuable additions made to their attractions ; the benefits of which hereafter will be very considerable in many points of view. Of that at Malta the *Hants Telegraph* thus speaks :—An interesting event took place here on Thursday, the 1st of August. On that day was laid the first stone of the New Royal Naval Dock in the French Creek, by Rear-Admiral Kellett, in the presence of the principal officers of the dockyard and a few private friends. The grand ceremony of laying the “key-stone,” will, it is hoped, come off about October, when the works will be far enough advanced to admit of the public being present, without fear of a flooding of the works, a contingency which is at present not at all improbable. Thanks, however, to the arrangements made by the Admiralty Civil Engineer, Mr. Lovell, everything worked admirably, and the stone was set at a depth below sea-level of forty-one feet, without any disappointment on the part of the authorities or the slightest inconvenience to the guests. As this dock will be the largest single graving dock in the world, some particulars of its dimensions, and those of other existing docks for the sake of comparison, may be interesting :—Length of floor, 430 ft. ; length at coping, 468 ft. ; width at floor, 42 ft. 6in. ; width at broad altar, 84 ft. ; width at coping, 104 ft. ; depth of water on cill, 33 ft. 6 in. ; depth from coping to floor, 39 ft. The dimensions of the first dock constructed at Malta by Mr. Scamp are as follows :—Length, 283 ft. ; width at floor, 26 ft. 9 in. ; width at coping, 82 ft. ; depth of water on cill, 25 ft. ; depth from coping to floor, 29 ft. 6 in. This dock was afterwards lengthened to 535 ft., and by means of a caisson, made capable of docking two ships ; in fact, converting it into two docks, or one large one, according to the requirements of the service.

It will be observed that while the old Malta dock has only 25 ft. of water over cill, the new one will have 33 ft. 6in. The following are the dimensions of some of the principal docks at home :—“ At Portsmouth.—Length of floor, 400 ft. ; length at coping, 426 ft. ; width at floor, 35 ft. ; ditto at broad altar, 75 ft. 6 in. ; ditto at coping, 99 ft. ; depth from coping to floor, 33 ft. 10 in. ; depth of water over cill, 28 ft. 6 in. At Birkenhead,—Length, 440 ft. ; width, 70 ft. 9 in. ; depth of water over cill, 26 ft. At Leith,—Length, 400 ft. ; width, 8 ft., depth of water over cill, 24 ft. 6 in. In Thames, Bow Creek.—Length, 400 ft. ; width, 64 ft. ; depth of water over cill. 24 ft. 6 in. The number of workmen employed daily by the department in the construction of the new dock at Malta, including those of contractors, is 500 besides those engaged at the quays. The work done in pumping is as follow :—6,048 gallons, equal to 27 tons, are lifted 45 feet every minute, which are equal to 8,709,120 gallons, or 38,880 tons, lifted 45 feet in the 24 hours. The engines are collectively of 85-horse power. The fresh water consumed has all to be distilled, and the quantity used is seventy tons a day.”

The other at Hong Kong is thus alluded to :—" On the 15th of June, the new dock at Aberdeen (on the southern side of the Island of Hong Kong), belonging to the Hong Kong, Canton, and Whampoa Dock Company, was opened in the presence of the governor and a large party of invited guests. This dock is over 400 feet long, 99 ft. broad, and 34½ deep. It has been cut out of the solid granite of which the island is formed, and is a very magnificent work. It is lined with hewn granite, and presents a very imposing appearance. The *Overland China Mail* looks upon the opening of this dock as an event of considerable importance. It says :—" The Hope Dock is undoubtedly the finest dock in the East, and whatever credit is due to the company and to all concerned with the organization and construction of such a masterpiece of marine architecture is freely accorded to the promoters of the scheme so successfully inaugurated on Saturday last. To convey a better idea of the advantages consequent upon the completion of such an undertaking, we may give some of the dimensions and peculiar features of the new dock. It is 410 feet in length over all, and 385 feet on the blocks ; it has a breadth from coping stone to coping stone of 100 feet, and 50 feet at the bottom ; its width at the entrance is 84 feet ; and its depth of water is 24 feet 6 inches at spring, and 22 feet at neap tides. It will thus be seen that it will be able to take in the largest merchant vessel or mail steamer which enters Hong Kong harbour, even at low water. The dock is, of course, constructed with the intention of accommodating either the ironclad *Warrior* or *Black Prince* (for draught of water), or for the Pacific Mail Company's steamer the *Great Republic* (for breadth of beam) ; and we understand that there is only one of the new ironclads—viz., the *Agincourt*, which draws some 26 feet—which is too large to enter the Hope Dock without being lightened previous to doing so. Under these circumstances, it would not be surprising if her Majesty's huge ironclads be sent out to the China station, for the existence of this magnificent dock now opened in Aberdeen Bay, Hong Kong, removes what would otherwise be an insuperable objection to their presence—namely, the impossibility of dock repair in the event of accident.

WE gladly assist in making known this last addition to the attractions of Hong Kong, and shall watch its progress with every desire for its success, although in no way connected with its interests.

In that same part of the world the coolie trade is claiming attention as under the pretended neutrality of the Portuguese, the horrors of the Slave trade seem to be encouraged. The *Overland Trade Report* says, in reference to the coolie trade :

Much interest has been felt in Hong Kong, in certain proceedings at the Legislative Council, which have drawn attention to the abuses of the coolie trade. An ordinance had been introduced by the Governor for the purpose of still further regulating such little emigration as is carried on from the port of Hong Kong. Of course, the ordinance was framed with the most praiseworthy objects, but it was opposed by the Hon. James Whittall and the Chief Justice, on the ground that in

view of the frightful atrocities which were perpetrated at other ports in connection with the coolie trade, the only proper plan of dealing with it would be to abolish it altogether. Mr. Whittall moved that the ordinance should be withdrawn and another ordinance brought in, prohibiting this coolie trade, that is to say, the engagement of coolies on contracts and their shipment to the West Indies altogether. He did not argue that, conducted as the trade was at Hong Kong, any great evils arose from it, but he spoke without the slightest reserve or hesitation, as also did the Chief Justice and the Governor himself, of the atrocious crimes perpetrated at Macao in open defiance of the intended regulations which exist on paper, and behind which the Macao government shelters itself when attacked. That the Macao coolie trade was an organized slave trade, that no voluntary emigration took place at all, that the unhappy men sent away were kidnapped and forced into slavery by those who made a business of enticing them on board small vessels up and down the coast and then selling them at Macao, all these shameful facts were emphatically asserted and supported, in one case, as will be seen from the report of what took place, by reference to that which was within the personal knowledge of the speakers.

Mr. Whittall and the Chief Justice were of opinion that the only way for Englishmen to put themselves in a position to remonstrate against the iniquities of Macao successfully, was to abolish emigration from Hong Kong entirely, because while it was permitted under regulations here, the Macao government would be able to flourish their delusive regulations and say, "our regulations are the same as your own." To prove at home what is the fact, that these Macao regulations are a hypocritical sham, while admitting that under proper regulations the trade was harmless, would, it was maintained, be much more difficult than to urge, after giving up the trade here altogether, that no regulations, however praiseworthy in intention, could purify it from the foul abuses that were inherent in the system.

The Governor, however, did not take this view of the case. He argued that the imperial government had sanctioned coolie emigration by the act of 1855, and that the Hong Kong council could not run counter to imperial legislation. Mr. Whittall and the Chief Justice, therefore, had to abandon their resolution, but it is understood that they intend as members of council to transmit through the Governor to the home government a memorial on the subject of the coolie trade, setting forth the frightful practices with which it is bound up, and the means by which in the interest of humanity the Macao slave trade may be assailed. We hope to hear more of this memorial.

HERE is an account of the tea ships on their annual race. The ship *Taeping*, one of thirteen vessels now engaged in a race from China to England, with the first portion of the new season's crop of tea, passed Anjer on the 27th of June. This ship, it will be remembered, arrived in the Downs last year at the same time as the *Ariel*. Owing to the flatness of the tea market the usual premium on the cargo of

the first ship will not be paid this year, but the interest in shipping circles attending this great ocean competition can hardly be said to have diminished. Subjoined is a list of the thirteen ships which have left Foochow for London :

SHIPS.	DATE OF SAILING.
Maitland	31st of May.
Serica	2nd of June.
Taeping	4th of June.
Fiery Cross	5th of June.
White Adder	7th of June.
Ziba	8th of June.
Flying Spur	9th of June.
Taitsing	10th of June.
Black Prince	10th of June.
Yang Tsze	12th of June.
Ariel	13th of June.
Chinaman	15th of June.
Golden Spur.....	18th of June.

The following relates to the Atlantic Telegraph :

The Telegraph Construction and Maintenance Company's ship *Chiltern* sailed to-day from Greenhithe with 320 miles of submarine cable on board for Placentia, in Newfoundland. The cable, which has been manufactured for the New York, Newfoundland, and London Telegraph Company, will be laid from Placentia to the island of St. Pierre, a French colony in the Gulf of St. Lawrence, and thence extended to Sydney, in Nova Scotia. Great efforts are being made during this season in establishing throughout Nova Scotia a series of land lines which it is hoped will enable the communications to be maintained between Europe, via the submarine cables, and Canada and the United States, throughout the coming winter, so as to avoid the serious interruptions to traffic which occurred last winter. In any case this new cable about to be laid will enable telegrams to be sent independent of the old land lines in Newfoundland, so that the risk of interruption by snow-storms and floods will be much reduced. Directly the *Chiltern* has laid the Placentia cable she proceeds to the entrance of Trinity Bay for the purpose of repairing the 1866 Atlantic cable.

By telegrams just received from the Admiralty surveyors in that neighbourhood, we hear that a shoal patch has been discovered in the immediate vicinity of the recent accident to the 1866 cable, and there is every reason to believe that the mishap occurred owing to that cable having accidentally been laid across this ridge, on which there is very little more than forty fathoms of water, and where icebergs naturally ground. Sir Samuel Canning, who so successfully submerged the Atlantic cables, aided by an efficient staff, has proceeded in the *Chiltern* to execute the above important works.

This shoal patch, we have no doubt, will receive attention which will bring it to light in our charts.

IN our last number we noticed the arrival of the American raft from New York. By the following, it seems like its predecessor, the little *Red, White, and Blue*, to have taken its place at the Crystal Palace.

Within the Palace, and in an exceeding quiet corner, was an exhibition of another and more wonderful result of human strength and daring. It was the American life-raft which so lately arrived in Southampton water, after a boisterous, but on the whole prosperous voyage across the Atlantic, over whose long waves it had been safely piloted by its brave and skilful Prusso-American captain. If we should have a few more achievements of this kind, we shall expect some day to hear of an enterprising American laying his hat down on the waters of the Hudson, booking himself as the only passenger in it, and then, having spread out his pocket handkerchief for a sail, making a prosperous voyage to some favoured harbour of "the old country."

The life-raft is not now for the first time exhibited in England. In the course of the present, almost the past, summer, Mr. Parry, the inventor, exhibited his raft on the Serpentine, but it is now an object of much greater interest, having actually proved its capabilities as a lifeboat by a voyage across the Atlantic. The captain speaks highly of its performance, making seven knots an hour, sailing, when necessary, within five points of the wind, and proving in all weathers so buoyant that it did not ship a single sea throughout the whole voyage. It is a very simple contrivance, consisting merely of three pontoons securely lashed together, and covered with an open wooden platform, in the centre of which a little "round house" gave shelter to the captain and his little crew. There are easily-worked air pumps attached to each pontoon, by which they can be inflated in eight minutes, and the whole affair, which may be stowed away in pieces in fine weather, can be put together and launched over the side very rapidly in case of necessity.

The advantages claimed for the life-raft are—first, its portability when not in use; second, the rapidity with which the pontoons may be inflated and the raft fitted for sea; third, the facility of launching; and fourth, the great number of people it would keep afloat. The captain informed us that it was tested in New York harbour with upwards of five hundred people either standing on it or hanging out of its sides, and that it kept them all afloat. This would make it an invaluable article on board an emigrant ship, where all the ordinary boats would be insufficient to take off the passengers; and this quality would also make it better than even a lifeboat, provided, as the captain states, it could be launched so much more rapidly. It is well-known that there is commonly great and sometimes fatal delay in lowering boats in moments of emergency, in consequence of the excitement of the men and the intricacy of the tackle; but, if we recollect rightly, there was also considerable delay at the Serpentine experiment in hoisting the raft over the bridge; although this is certain, that once in the water it righted itself in a moment, and in another was covered with passengers, whom it carried safely to the

landing place. Taken with all qualifications, the recent arrival at Sydenham is well worthy a visit and careful inspection from those who take an interest in the saving of human life at sea. The captain is a frank and intelligent sailor, and will give every information to visitors.

OILING THE SEA.—In our account of one of the gales encountered last October in the Arctic ocean, it will be remembered that we stated the circumstances of Captain Penniman having saved his vessel, the *Minerva*, by pouring oil into the foaming sea. A whaleship master (which is probably Captain P.) writes to the New York *Herald* that he has followed the sea for twenty-eight years, and been master for ten years, and during that time has saved the vessel under his command twice by “oiling the sea.” He says :

“That when the master of a ship cannot get out of a storm—that is, when a ship is disabled and he has to take the heft of the gale—if he has oil on board, start two or three gallons over the side of the ship. This will give the ship smooth water to the windward, and then the oil allowed to run drop by drop is all that is required, for as soon as the sea comes in contact with the oil it breaks, and the ship is in smooth water as long as the oil is allowed to run. In 1864, in the heaviest gale of wind I ever saw, I lost all my sails, then the rudder, and I know the vessel could not have ridden the sea for an hour if I had not had oil on board. Five gallons of oil lasted me fifty-six hours, and this saved the vessel, cargo, and lives on board. Let ships of heavy tonnage have two iron tanks of forty gallons each, one on each side, with faucet so arranged that the oil can be started at any time ; small vessels ten gallon tanks, and all ship’s boats tanks of five gallons each, well filled, so that in case the ship founder or burn, the boats will have oil to smooth the sea in case of a gale. With these tanks of oil on board of ships and a good man for master—one who knows the laws of storms and handles his ship so as to get it out of the centre of the storm—you will have no more foundering of good ships at sea, with the loss of many lives and millions of money.”

NAUTICAL EXPRESSIONS.—We understand that the subject of our seamen’s lore engaged much of the attention of the late Admiral W. H. Smyth, who had collected ample matter for the formation of an important volume on the subject. There can be no doubt of the deplorable condition in which a large portion of their vocabulary has long been lying, and from the well-known erudition of the Admiral, we anticipate much rectification of orthography, illustrated by authorities for many expressions of vague formation. Our anticipations we are glad to find encouraged, as the brotherly task of the editor has been performed by Admiral Sir Edward Belcher. Thus from two such able Naval officers a most valuable work may be expected.

MEDITERRANEAN TIDES.

THE question of real tidal influences in these waters must be regarded as still subject to discussion, although a large amount of careful observation was, many years ago, brought to bear upon it by Admiral Smyth. It is certain that there is a diurnal change of level, and extremely probable that this is due to lunar action, but the amount of flux and reflux is small, and greatly interfered with by winds and currents. Thus at Venice, it is considered that time of high water takes place about an hour and a half before the moon reaches the meridian, and again after an interval of twelve hours, while the times of rising and setting of the moon are the periods of low water. The change of level is stated to vary from one to four feet at the head of the Adriatic, but is probably less, and is so completely interfered with by occasional currents produced by local winds, as after to be altogether masked and lost sight of.

But while at the head of the Adriatic the tide due to the moon's attraction is thus masked, it is even less clear in the Ionian sea, where the water is more open. In Corfu, as at Argastolè, in Cephalonia, it is only in embayed seas that the effect is determinable; and it generally only ranges between two inches and a foot. Still there can hardly be a doubt there does exist a periodical rise and fall of the water, and the result, even of this wave, ought to involve a corresponding change of the air and secure good health. That this is not the case is probably due to the interference of prevalent winds with the real tide.

There are many causes acting to produce a change of level in these waters, and each helps to complicate the others. Thus, in some places and during some seasons, the vaporisation of the water in the open parts of the sea may help not a little, while sometimes the continuance for an unusual period of some prevalent wind, and even the earthquakes, by producing large waves, are enabled to influence greatly the level of the water at enormous distances. The whole subject, though of much interest, is surrounded by difficulties, which render it difficult to determine accurately the meaning of local observations.

On the whole however, we must regard the Mediterranean as being subject to one or more direct small tides, besides having its waters disturbed by occasional storm, but as the regular tide is very small, and the flux and reflux of the tide in a large ocean is accompanied by the disturbance, equally regular of the great atmospheric wave, so this occasional change of level may, perhaps, be accompanied by small oscillations in the pressure of the air, and be connected with the winds. Certain winds prevalent for a long time must inevitably drive the water into, or out of, the various embayed portions of the Mediterranean and the reflex action of the wave thus produced may act again on the atmosphere.

Nautical Notices.

[Communications for the Editor of the *Nautical Magazine* to be addressed to him at 31, Poultry.]

PARTICULARS OF LIGHTS RECENTLY ESTABLISHED.

(Continued from page 465.)

Name.	Place.	Position.	F. or R.	Ht. in Ft.	Dist seen Mls	Remarks, &c. Bearings Magnetic.
41. Cape Otranto	Adriatic	40° 6'·4 N. 18° 30'·6 E.	F.	196	13	Est. 15th July, 1867.
Taranto Har- bour Entrance	S. Paolo Islet	40° 26'·3 N. 17° 10'·1 E.	F.	66	10	Est. 15th July, 1867, instead of present temporary light.
Algiers	Extension of North Mole	... ..	...	...	...	See Note (a).
42. United States	Cultivator Shoal	40° 36' N. 68° 11' W.	...	...	...	See Note (b).
	Nantucket Shoal	40° 56' N. 69° 20' 7" W.	...	...	...	See Note (c).
Crooked Island Passage	Castle Island	... ..	...	...	...	See Note (d).
F. Fixed. F.fl. Fixed and Flashing. R. Revolving. I. Intermitting. Est. Established.						

(a) ALGIERS.—*Extension of North Mole.*—As the north mole at Algiers is being extended in a south-easterly direction by the sinking of large blocks of stone, mariners are cautioned to give the mole head a wide berth, especially at night.

(b) UNITED STATES.—*Cultivator Shoal westward of George's Bank.*—The U. S. Government has given notice, that a dangerous shoal has been discovered westward of George's bank, in the track of vessels from Europe to the United States.

This shoal—named the *Cultivator shoal*—extends in a S.E. and N.W. direction, upwards of five miles in length, with broken spots of eight and nine fathoms water and three fathoms on the shoalest part, hard sand.

The shoalest part is in lat. 41° 38' N., and long. 68° 11' West of Greenwich.

On approaching it the water suddenly decreases from fifty to fourteen, nine, and ten fathoms and then to six; but in nearly all weather, during daylight, the ripple or breakers on it can be seen in time to be avoided.

A buoy has been placed on the shoal in nine fathoms water.

(c) *Nantucket Shoals.*—On a part of the Nantucket shoals, north of Phelps's bank, is a shoal, named *Lott's breakers*, in lat. 40° 56' N., long. 69° 20' 7" West of Greenwich, on which there is six and a quarter fathoms water.

This shoal can be seen from a distance of two miles in the daytime, and when the tide runs at its full strength small breakers show themselves.

(d) WEST INDIES.—*Crooked Island Passage*.—The lighthouse in course of erection on Castle island, at the southern entrance of the Crooked island passage, is now completed and ready for the reception of the light, previous to its exhibition. Mariners are informed of the completion of the building, as it forms an excellent day mark for the Crooked island passage.

CHARACTER OF RADAMA II.

MADAGASCAR REVISITED: *describing the events of a new reign, and the Revolution which followed, etc., etc.* By Rev. W. Ellis, author of *Polynesian Researches, etc., with illustrations.*

THE interest excited by the accession of Radama to the throne of Madagascar, the great change by which that event was attended, and the extent to which his brief reign may continue to affect his country, render a slight extension of this obituary notice not inappropriate.

This prince, although born about twelve months after the death of the previous sovereign, received from his mother the name of Radama. Subject as that mother was to passions as fierce and ungoverned as ever agitated any human being, and possessing as she did a heart as relentless and cruel as ever lodged in any human breast, it was often a marvel to me that the son of such a mother should have possessed any of the kindlier feelings of our common nature. It is not easy to form an idea of a more terribly appalling state of society than that in which such an individual occupied the highest position. Not only was the innocent blood of the best in the land shed to open for her the way to the throne; but all the near relations of her husband were sentenced to the most cruel deaths that could be devised, in order to secure to her its undisturbed possession. The own brother, the sister, and the mother of the first Radama were starved to death. The brother endured sufferings which even the sentries placed to guard him could not bear to look upon. Other near relatives fell beneath the executioner's spear. The father of her unborn child, accused of treason and witchcraft, was sentenced by her to die; and when afterwards her sleep was disturbed by dreams and visions in the night, the body was exhumed and decapitated, the severed head, according to the direction of the diviners, being placed at the feet and the head of a black dog fixed in its place. But as the frightful dreams continued, the bones were taken up and burned, and the ashes scattered to the winds. The house in which the officer had lived was then pulled down, and the very earth on which it stood thrown over the Tarpeian rock, the foundations being sprinkled with sacred water. A sister and other members of the same family were subjected to the tangana, then strangled and their bodies burnt to ashes. Such were the conditions under which, as an infant, Radama entered upon life.

The child of this mother was also cradled in all the superstitions of the country; and initiated as he was in the far-reaching delusions of that superstition, it was more surprising to me that his mind should be so generally free from the taint, than that their influence should, towards

the close of his life, have to some extent assumed mastery over his then shattered reason.

The circumstances and associations under which childhood and youth are passed generally influence the future character of individuals, as much as the dispositions and tendencies derived from parentage; and the moral atmosphere which surrounded Radama from his earliest years, was such as it is scarcely possible for members of a state of society like our own to form any adequate conception of. Naturally gay and light-hearted he was fond of pleasure. Music and dancing entered largely into the amusements of the court at Antananarivo. At some seasons night dancing and revelry formed part of their pastimes, in which vast multitudes engaged. Every source of pleasure was lavishly provided for the only son of the sovereign—the heir to the throne. Associated with him in these amusements were a number of youths of his own age, children of other branches of the royal race, or of the highest nobles of the land; and under such circumstances it was scarcely possible that his youth and early manhood should have been morally purer than those of his associates, and there is no evidence that it was less so.

But these were not the only perils of Radama's youth. There were officers of the government capable of teaching him to read and write, and supplying him with books, and to their instruction and training his youth was confided. Until the members of the mission sent by Sir W. Stevenson, Governor of the Mauritius, returned from Madagascar, we had never heard that there were books unfavourable to Christianity in the country; but these officers found that one of the teachers of the prince was reading "Paine's Age of Reason." While waiting at Mauritius, I myself received from this instructor of the prince a "brief account of Radama," with a request from the author to have it published, and this account stated that the king was a Deist; that he believed there was one Supreme God, but did not believe the Bible; that he was neither Protestant nor Catholic, Mahomedan nor Pagan, but respected all who love peace, and obeyed the laws, whatever their religion might be. I did not publish this account, for I did not believe it to be true; but I sent home with other documents a copy of this, to me, painful and ominous sign of danger. I could not doubt that the king's religious opinions and feelings had been tampered with, though not perhaps to the extent stated, especially as the Christians still spoke of his friendship, encouragement, and aid.

When we consider the relative positions of the prince and the Christians—he brought up by the side of the queen, and as heir to the throne, flattered by all those whose loyalty or self interest prompted them to seek the favour of the present ruling powers, and a favourable recollection when he himself should be sovereign—it appears but little likely that he should have become in any way interested about the Christians. But when we consider, further, that the prince must from his childhood have heard the Christians denounced, if not executed, both as apostates and traitors, bewitched by the sorcery of foreigners, and enemies to all that was ancient, established and honourable in the country—whom it was necessary to sweep away, root and branch, from the face of the earth; who were to be seized wherever seen, imprisoned, enslaved, tortured, burned, speared, or stoned to death,—it would have been only natural had the prince regarded them with abhorrence, and shunned them with fear. But that he should have shewn kindness towards them, and finally have become their advocate, friend, and protector to the utmost of his power, was as remarkable as any event which distinguished the long and severe persecution in Madagascar.

That the young prince became all this to the Christians, every heathen or Christian, native or foreigner, acquainted with the events of the time, freely testifies. When Radama pitied and succoured the Christians, enquired about their books and their worship, expressed his approval of their faith and their practice, as far as he could then understand them, we cannot wonder that they should think he was himself inclined to become a Christian. And when further he sought occasion to warn them of coming danger, and endeavoured to avoid it, alleviating to the utmost of his power its severity, pleading with the judges, favouring the escape of the accused, assisting in their concealment, sometimes in his own house, redeeming them when sold into slavery, with his own money, and encouraging them to trust in God, we cannot wonder if the Christians were led to think that the Spirit of God had moved the heart of the prince thus to favour them out of his own regard for the faith which they professed.

And when, for the sake of saving their lives, the prince said, as he is reported to have done in the council of the government—"Why should the Christians be put to death, they had done nothing but good to the country. If because they are Christians they are to suffer—I am a Christian. If people are to be put to death because they read the sacred Book and pray,—I have done this. I must be put to death;" If the prince made this open declaration, as it is not unlikely that he did under the impulse of his own generous emotions, it was very natural that they should think he had become a Christian, and should write of him as such, although at the time the prince might have meant no more than to shew the injustice of putting men to death who were good subjects, of whose religion he approved, whose books he had looked into, and at whose worship he had been present.

I can easily conceive of the Christians under these circumstances, writing to their countrymen in Mauritius or their Christian friends in England, that the prince was a Christian without intending to deceive or exaggerate, and that he also should have spoken in this manner without having become a Christian in his heart, or have entered personally upon a Christian course of life.

I can also easily conceive without attaching blame to any one, how, on the arrival of these statements in England, persons deeply interested in the subject, and not able to understand the difference between the state of society in England and Madagascar, would think that the prince was almost a Christian and not far from the kingdom of heaven. I had heard from the native Christians before I left England, that he was a Christian; but the warning I received at Mauritius, in the document above noticed, and the statements from the Rev. Mr. Le Brun confirmed my conviction that his conversion was a blessing still to be desired and prayed for. Nevertheless when I remembered the many Christian lives which he had been the instrument of saving, the vast amount of suffering and misery which he had prevented or alleviated, and the cordial manner in which he encouraged every effort to extend the Gospel in the country, I could not but hope that he would himself become personally a partaker of its blessings.

It was under this impression, and also from the intimation I had received of his deistical tendencies, that I devoted so large a portion of the time which I spent with the King in reading the Bible, in endeavouring to set before him its manifestations of the Fatherhood of God; of the divine love and mercy shown in the great work of redemption by the Lord Jesus Christ, with its ample provision for satisfying the yearn-

ings and necessities of man's higher nature, which he to some extent seemed to understand and feel, although such impressions were transient as the morning cloud, and passed away as the early dew.

There is but little doubt that Radama's interest in the Christians was first excited by their severe and unjustly inflicted suffering. The earliest instance of this that I can recollect was when Prince Ramonja, the descendant of a long line of chiefs of a conquered race, the early friend and protector of the Christians, was reduced from his high position on account of his Christianity and sentenced to serve in the ranks of the army. Radama went to see him, and wept when he beheld the scanty clothing which his friend wore, and the coarse rice on which he fed, and when he heard of his suffering from cold on duty during the night. Nor did his compassion end in tears. He sent him food from his own kitchen, but this was mixed with the common rations of his mess, and Prince Ramonja shared in every respect the lot of his comrades in the ranks to whose grade he had been reduced.

Benevolence and kind-heartedness distinguished Radama through life, and presented one of the most striking contrasts that could be imagined between the mother and her son. The benevolence and kindness of the Prince appeared innate, and was exercised irrespective of colour, rank, or nation. A number of French sailors who had cut down a flagstaff at Fort Dauphin, in the south, were seized and sent for trial to the capital. As they approached Antananarivo, the Prince and some of his attendants met them shoeless and with bleeding feet, slowly travelling to the city; taking off his own shoes he gave them to one of the sore-footed sailors, and sent one of his attendants to fetch shoes for the others. These men were foreigners belonging to a nation not thought at that time to be very friendly to the Hovas, and they were also prisoners coming to be tried for offences against the Malagasy law; but notwithstanding this, as soon as the Prince saw they were sufferers he hastened to give them relief. Radama's sense of the sacredness of human life, and his unconquerable aversion to its destruction, were the most remarkable traits in his character, and I have often thought that if not originated, they were matured and confirmed by the shock and revulsion of feeling produced by the waste of life, and the spectacles of bloodshed which must have been made familiar to him during his mother's reign. I believe it was his firm purpose that no human life should be taken by his authority, and that his reign, whatever might be its duration, should be designated by succeeding generations as the "bloodless reign." At least so he said once to me.

Radama's fondness for company and his pleasure in society, rendered him an easier victim to intemperance than he might otherwise have been; and owing to some peculiarity of constitution, he was affected by a quantity of wine so small as not to produce the slightest difference with his companions. But if the account of his drinking habits before the time of my arrival were true, there certainly was an encouraging change for the better in this respect for many months before his death.

From the time when Radama ascended the throne and proclaimed religious freedom to all classes in the country, he allowed no interference with the idols, their keepers, or their worshippers; but he had, long before this, ridiculed the pretensions of the priests, and openly tested the power of the idols. Their priests or guardians had boasted of the power of Ramahavaly, one of the chief national idols, as being itself indestructible and irresistible. The prince employed some men to go and set fire to the house in which the idol was kept, as a means of satisfying his own mind. The men at length accomplished their object, and when

the flames of the burning idol's house blazed up through the darkness of the night the prince, standing outside the palace, called his companions to gaze at the startling, and to him, important conflagration. He never afterwards believed the idols to be in any respect different from the materials of which they were composed in their ordinary and natural state. The pretended communications from the spirits of his ancestors was the only form of superstition by which his mind was ever after affected.

The king abolished the ordeal by tangena or poison, and never employed or encouraged divination. He only listened to the pretended supernatural communications of the idol-keepers during the prevalence when they professed to bring messages from his ancestors, and thus appealed to a weak and credulous part of his character. This first excited my fears that his reason had lost its balance, and that his mind was seriously disordered.

The strange and unaccountable proposal to issue a proclamation which would encourage the indiscriminate shedding of blood, and would apparently legalise murder, was so entirely opposed to that abhorrence of the taking of human life, under any circumstances, which had until the last few weeks been the most decided feature of Radama's character throughout the whole of his life, that to me it seemed to admit of no other explanation than that his mind at the time was not sane. This natural and hitherto consistent aversion to bloodshed, appeared towards the last to be obliterated by superstitious influences, but to be revived in the last moment of his consciousness.

I have never said that Radama was an able ruler, or a man of large views, for these he was not; but a more humane ruler never wore a crown. He never consented to the secret destruction of an enemy, nor signed the death warrant of a criminal; and amidst all the agitation and intimidation of a successful revolt against himself, he risked his throne and his life rather than consent to the death of his friends; and the catastrophe which followed was probably in a large measure owing to his persistent endeavours to save them. Even those who strangled him are said to have made no answer to his last appeal for mercy to himself, when before the twisted girdle round his throat deprived him of utterance, he is reported to have exclaimed—"I have never shed blood!" In those solemn moments, when the pomp and pageantry, the greatness and the power of royalty are vanishing for ever from those whom they have heretofore surrounded, and the realities connected with them alone remain, alas for ever; when the throne has been vacated, and the mouth of the grave apparently entered, how seldom have royal lips closed with the utterance of Radama—"I have never shed blood."

The proposal to issue the obnoxious and fatal law was the immediate occasion of the revolution, its causes were of deeper and earlier origin. To remove the *menamaso*, as the king's agents and confidential advisers were called, to replace the power and patronage of the government in the hands of the party in the state which originally held it, to re-enact in parts the laws which had been abrogated, to increase if possible the army, to retain the advantages of commerce with foreign countries, but restore the former system of internal government as far as possible, with the toleration of Christianity, and the permission of education, were probably the chief objects sought by the change which had taken place. Whether this substituting of other men for the *menamaso*, and allowing the king to retain a nominal sovereignty, while the new ministers should actually govern the country, or whether the course which things actually took was

intended from the first, cannot perhaps now be ascertained. The authors of the king's death would have stood higher in the opinion of other nations had they allowed him to live, even though deprived of real power, but the peace of the country might not have been secure so long as he remained alive amongst the people.

The opening of the country to the industry, enterprize, and skill of foreigners, the entering into treaties of friendship and commerce with England and France, and the re-establishment of perfect liberty and equality for natives and foreigners, placed the relations of Madagascar with other countries on a better foundation than had ever before existed. The forbidding of all persecution on account of religion in the country, and the granting of sites for the memorial churches, the abolition of the *tangena* and the punishment of death; the diminishing the attendance required of the soldiers, and reducing the amount of unrequited service demanded by the government; the introduction of the payment of wages for work done by the natives, together with the substitution of friendship and confidence amongst the different tribes, instead of distrust and hostility; thus seeking by justice, generosity, and peaceable measures, to bind the different races to their rulers, and to each other, rather than to hold them in subjection by force;—these are among the benefits of Radama's brief reign, which will perhaps be remembered with advantage to his country, when his failings, his errors, and his vices shall have been forgotten.

TO THE EAST BY THE WEST.

THE intelligence received a few days ago from China and Japan by way of San Francisco must have startled many minds that have not kept pace with the progress of the recent successful efforts made to reach the old East by going westward. But enough has already been accomplished to show that the future route to Asia is to lie through our Pacific possessions and across the Rocky Mountains, and this is not only for us in the Atlantic States, but for England and the other commercial nations of Western Europe. A mail line of steamers has now been started to run between San Francisco and Yokohama, Japan, with which latter port there are steamers connecting the ports of China. When the arrangements shall have been matured the company having charge of the matter will, it is said, extend their operations eastward from New York to Liverpool, so that the chain of connections will ultimately be as follows:

	MILES.	DAYS.
Liverpool to New York	2,350	10
New York to Aspinwall	1,980	7
Across the Isthmus	48	1
Panama to San Francisco	3,182	11
San Francisco to Yokohama	4,761	17
At Yokohama	..	1
Yokohama to Hong Kong	1,879	6
Total	13,700	53

The completion of the Pacific Railroad will knock off ten or twelve days from this table, so that there is no possibility of any route eastward through Europe competing with this. How much the time for communicating intelligence through the telegraph will be shortened, it is impossible to foretell. Even a Pacific submarine cable, reaching to China and Japan, does not seem so improbable as an Atlantic cable did a few years ago.

We cannot help seeing that one of the consequences of this closer connection with the East will be a greatly increased emigration from those dense and over-populated countries. Already there are sixty thousand Chinamen in California, diffused through every kind of labour. Cutting down the Sierra Nevada for the road-bed of the Pacific Railroad, engaged in woollen and other manufactures, and doing in the larger cities the work of washerwomen and chambermaids, no work comes amiss to them, and they do it all well and cheaply. They have proved so invaluable to the state, that the bitter prejudices at first entertained against them by most, and still harboured by the Irish and a few individuals among the native Americans, have so far given way that the disqualifying laws passed against them will probably be repealed at the next session of the Legislature, and "John" will become a citizen, if not a brother. The prospect of absorbing a much larger swarm of Oriental emigrants looks rather dubious to be sure, but our national experience of late years bids us to be discouraged at nothing.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY,
in August, 1867.—Sold by J. D. Potter, 31, Poultry, and 11, King
Street, Tower Hill, London.

2. British Islands, various authorities to 1867. 2s. 6d.

207. Ionian Sea, Morea Western Coast and adjacent islands. Capt. Mansell, R.N. 1867. 2s. 6d.

483. Trinidad Island, West Indies, Paria Gulf. Com. Chimmo, R.N. 1866. 2s. 6d.

36. Persian Gulf, Basiduh and approaches, with views. Com. Constable, I.N. 1860. 1s. 6d.

962. Philippine Islands, Ports therein, Spanish survey to 1867. 2s.

1968. China Sea, Formosa Island and Strait. Capt. Collinson and Edward Wild, Master, R.N., to 1867. 2s. 6d.

1042. Australia, North Coast, Cape Stewart to Port Essington. F. Howard, Master, R.N. 1866. 2s. 6d.

1252. Fiji Islands, Moala Island, and views. Capt. Denham, R.N., F.R.S. 1856. 2s.

EDWARD DUNSTERVILLE, *Commander, R.N.*

*Hydrographic Office, Admiralty,
21st August, 1867.*

THE
NAUTICAL MAGAZINE

AND

Naval Chronicle.

OCTOBER, 1867.

CONSIDERATIONS of the winds, currents, and tides of the Gulf of Cadiz, and the Western Shore of the Spanish Peninsula, with the best points for making the coast from sea, and how it should be navigated.

[There are few parts of the ocean more frequented by ships and seamen than the Strait of Gibraltar and its adjacent sea; and a general view of this subject bearing on the requirements of the navigator could not perhaps be looked for from a more worthy source than the chief of the Royal Hydrographic office at Madrid. The current volume of the *Anuario Hidrografico*, our usual copy of which having been so considerably presented by Don Salvador Morena, we lose no time in preparing a translation of the paper on the subject that it contains, and which will be completed in future numbers of this work.

The reader will remember the papers on the Ladrões in our last year's volume obtained from the same source.] We now commence the "Considerations."

As that part of the Iberian Peninsula under present consideration varies much in its contour—one line of its coast being nearly at right angles to another, and as this difference of direction produces an effect on the winds and currents that prevail in its neighbouring seas, it will be as well to classify them, describing first their prevailing characters between the Strait of Gibraltar and Cape St. Vincent, and then those between this Cape and Cape Prior.

Before we proceed with them, however, let us state what we mean by—

NO. 10.—VOL. XXXVI.

3 N

The Gulf of Cadiz : the portion of coast included under this name is the great bay which the South coast of Portugal and the Sea coast of Spain form with the coast of Morocco. The limits of this gulf which might be permanently named the Gulf of Cadiz are the Cape St. Vincent to the north, and that of Mazigan to the South, those capes lying N.N.W. and S.S.E. of each other two hundred and thirty miles distant. This great gulf, which as we have observed is entirely open to winds from West to South, would be no doubt very dangerous to vessels if it had not at its interior, the Strait of Gibraltar, and a little to the northward of it the excellent shelter of the Bay of Cadiz.

Coast of the Gulf of Cadiz.—The coasts of this gulf are generally low and uniform, excepting those in the vicinity of the Strait and about Cape St. Vincent. Besides, much of the coast about Cadiz is fringed with outlying and dangerous reefs, from which it would not be easy for vessels to extricate themselves if they had not that port to run for. Fortunately the whole shore of the gulf is lined with a bank of soundings, which on the Coast of Spain and Portugal, taking the one hundred fathoms line, extends out from fifteen to twenty miles; and from the African shore to nearly the same distance, thus giving ample warning to the navigator by the lighter colour of the water, of his proximity to the shore, should he not be able to distinguish this on account of its distance and the state of the weather.

Winds in the Gulf of Cadiz. It is admitted that winds are merely currents of our atmosphere, occasioned by diversity of temperature; and that such currents are affected by the configurations of continents over which they pass, the presence of seas near them, lakes, river overflows, etc.

We also know that while in a certain extent of sea, a certain wind prevails, in another not far from it another wind is blowing, if not directly opposed to it, at least from a very different quarter. Thus we find that in the limited space of the ocean under consideration, off the western part of the Peninsula, fresh northerly winds may prevail; while in the southern portion of it, S.E. winds are blowing of more or less duration. This contrast of direction is very remarkable, and owes its origin not only to the configuration of the coast, but also to the proximity of the Mediterranean.

Within the Gulf of Cadiz and especially near the Strait of Gibraltar, easterly and westerly winds are the most prevalent, while on the coast of Portugal and Galicia, northerly and southerly winds are the most common. Let us here observe that what we mean by the term "*Easterly*" (a term used by the generality of navigators on the South coast of the Peninsula,) refers to those winds from the "*Eastward*," which blow from E.N.E. to E.S.E.; and by the name of westerly, those which blow from the opposite points, or from W.N.W. to W.S.W.

Easterly winds. Within the Mediterranean Easterly winds are generally moist and attended with foul weather, heaping dense clouds on the mountains on the eastern side of the Strait of Gibraltar; but are very dry and clear on the coast of Cadiz, Huelva, and Algarve, as if in traversing the heights of Algeciras they dispose of all their

moisture and mist on the cordilleras which separate the high land from the low.

Force of the Easterly wind. The strength with which the easterly wind blows, increases until it passes the meridian of Tarifa; but it then soon loses its strength as it approaches Cape Trafalgar, and frequently does not even reach Cadiz. It must be observed, however, that this same strong *Levanter* which scarcely reaches Cadiz continues established in the parallel of the Strait to a much greater distance from its western entrance.

It is also to be noted that while the fresh *Levanter* prevails within the Strait at Cadiz and in the Gulf of Huelva, land and sea breezes are blowing at Cadiz, and in the Gulf of Huelva, Cape Trafalgar being almost always the dividing limit of these contending winds. Thus it is common, particularly in summer time, for a vessel to be running through the Strait with a strong *Levanter* and then into Cadiz with a fresh sea breeze. In such cases the *Levanter* accompanies the vessel to the meridian of Tarifa, and sometimes to that of Trafalgar, losing in strength and hauling gradually to S.E. and South until it arrives at S.W. or W.S.W. If the navigator bound to Cadiz foresees this change, he does not keep along the coast, but runs on a parallel to the southward of Tarifa, so as to be well clear of Cape Trafalgar, and in a good position when he catches the sea breeze to make Cadiz with it.

Slackness of the Levanter. Sometimes the Easterly wind is two or even three days in reaching Cadiz, and sometimes even although it may be strong in the Strait. Sometimes also it will reach Chiclana and Carraca without touching the mouth of the Bay where only the sea breeze prevails. But in this latter case it soon becomes general, extending over the whole coast as far as Cape St. Mary or even west of this Cape. Sometimes also it does not pass the Broa de Sanlúcar.

Yet when the *Levanter* is spreading as just observed it also becomes intermittent. It comes in gusts of brief duration, as if it would overcome its opponent the western breeze. In these cases vessels from the Strait making for Cape St. Vincent have it partially or in gusts until it becomes general. Sometimes it does not pass the meridian of Cape St. Mary where it generally meets the Westerly wind.

On the coast of Cadiz or between Cape Trafalgar and the mouth of the Guadalquivir the *Levanter* also comes in gusts; but when once established it maintains its place, and above all in summer time, lasting sometimes as long as fifteen days together. Perhaps the only intermission of it is about sunset, and slackening throughout the night, but recovering itself about daylight and regaining its former strength as the sun gets at its height. It will thus set in with some gusts soon after sunrise, becoming stronger as the sun gets at its height, and blowing hardest about noon. In recompense for this there are some years in which this most pernicious wind will not blow for even a couple of months.

Ill effects of the Levanter.—The greatest scourge of the bay of Cadiz is undoubtedly the *Levanter* or East wind. When this wind has been continuing for a week, perhaps for a fortnight, especially in those

places which are heated by it, all mercantile transactions are suspended, and the most powerful boats can scarcely be trusted except in the night or early mornings when it is slack. On these latter occasions, the *Levanter* will sometimes become so light that it will even assume the benign influence of the land wind and will draw to the north-east; but as soon as the sun is up it again makes itself felt with severe gusts and at nine or ten o'clock no boat can cross the bay. This mostly happens in the hot season, and at times when it is scarcely felt in the eastern entrance of the Strait of Gibraltar.

Principal character of the Levanter.—From the meridian of Tarifa to the westward the *Levanders* are very dry and clear, especially in summer. When, in this season, they blow with the intensity above-mentioned, they are attended with a suffocating heat, which obliges the people of Cadiz and its vicinity as a protection from it, to close their houses hermetically if they can, and prevent the dust which it brings from entering their dwellings. In its course it destroys the crops and produces much ill effect on health. Within the bay it blows from E.S.E. and S.E., excepting about daylight when it is E., or even E.N.E.

Aspect of the Levanter.—While the *Levanter* lasts, the sky keeps clear; but the horizon is somewhat heavy, and the land misty. If a cloud be seen it is very light and high, of the *cirrus* order. The sun rises and sets very dull and hazy, so much so that the eye can look at it without flinching. Dryness is its distinctive character on the western coast of the province of Cadiz, one totally different to that which it presents on its eastern shore, where it is remarkable for its humidity.

The most lasting *Levanders* are those which establish themselves by slow and gradual progress, or which do not reach Cadiz until they have prevailed for two or three days in the Strait: those which come suddenly and perhaps with much strength are the soonest over. In winter time the *Levanders* do not last so long, and at their commencement are clear, but lose this quality when they become S.E.: then they also bring heavy clouds and showers, sure signs that they will haul to the southward, and change to the *Vendaval*, or S.W. wind.

Indications of the Levanter.—The warnings of the *Levanter* are the entire absence of dew, and the peculiar dryness of every thing about the decks. In calm weather, or when the wind is very light from the westward, this dryness is very evident, and at the same time light threads of gossamer will be seen clinging to the rigging; they are sure indications of the approaching *Levanter*. Some persons believe that these filaments of gossamer are really threads of spiders. But such is scarcely credible. If we consider the enormous quantity that the *Levanter* brings with it while it lasts, some fine, some coarse, it is impossible to imagine there can be such a multitude of spiders to produce them in the small tract of country between the heights of Algeciras and the plains of Chiclana. We suspect that they are a watery meteor which is imperceptible from its minuteness. The same phenomenon is found at Vera Cruz with northers, and at the

river Plata with Pamperos, as well as in the interior of the continents when dry winds prevail. It is frequently observed in the country about Madrid especially in autumn.

There are others who consider these filaments are produced by microscopic spiders which emit them in dry winds. It is sufficient to see the secretions of the insects which are the property of the microscope? Masses of these filaments are found on the vessels anchored at Cadiz clinging to all parts of the rigging, some very fine and others coarser, and there are also some which are clotted and tolerably long, transparent, and also opaque, white, and generally elastic. Some are found coagulated together in the water and all separate when taken by the hand. With close attention they may be seen to cover the surface, carried along by the wind like skeins of thread. With this same wind, the *Levanter*, none of these are found in the rigging of vessels anchored at Algeciras. What does it consist of? This phenomenon must have some relation to the hygrometric condition of the atmosphere. On the shores of the Gulf of Mexico in the dry season it is also observed: there these gossamers are generally called the threads of the virgin, and considered an infallible proof of an approaching norther. The same phenomena are observed in the river Plata where they are found in the midst of fine weather with a light northerly wind and a clear sky and are the same precursor of a pampero. The same is observed on the shore of the Spanish peninsula. In all these cases the atmosphere is very dry and transparent, and the threads adhere to all parts of the vessel from the trucks to the sides, not even excepting the persons on board.*

* In reference to this subject it may contribute towards settling the question of whence do these numerous filaments come by quoting the following extract from the *Commercial Advertiser*, published at Honolulu, Sandwich Islands (weekly); or as they are improperly called Hawaii, the French pronunciation for Cook's "Owhyhee." It appears to be addressed to the "curious," and certainly in the subject of these filaments, or "threads of the virgin," there is enough to excite the attention of curiosity. It reads thus:—

"FOR THE CURIOUS.—An old resident on Hawaii, whose letters are always welcome, sends us some incidents relating to spiders: 'Will some of the scientific gentlemen of Honolulu explain the following facts. Many years ago, perhaps forty-five, while residing in the United States, I one day saw, in the latter part of summer, a spider start from a bush and go up at an angle of about 45° without any web to go on. In after years I often thought of the above incident, and came to the conclusion that I was mistaken. About eight years ago, I observed a green spider, being of a different colour from any I recollected to have seen before. I broke off the bush on which I found it, and was examining it rather closely, when he started off as the first had done. Two years ago last July, on the mountain side of Hualalai, I saw one of the common large spiders of Hawaii, up some forty feet in the air with considerable web floating above it. It was nearly calm, and no tree within a quarter of a mile. A gentleman was with me, whose attention I called to the spider, but no explanation of the phenomenon could be given by either of us. One week ago I saw the same thing again in an open plain. As I have not heard of any other person seeing spiders in such a position, I have come to the conclusion that it was not a common thing. Now I wish to know how so large a thing as a full grown Hawaiian spider can float in the air; or if suspended, to what can it be attached?'"

It is not essential to our question that the spider should float in the atmos-

Signs of the Levanter in Gibraltar Strait.—The experienced mariner who may be at Cadiz knows very well when the *Levanter* prevails in the Strait. If he sees on the heights of Ubrique, and the more elevated mountains of Algeciras little white clouds like bunches of raw cotton adhering to their summits, he knows they are proofs of the easterly wind blowing in the eastern entrance of the Strait. And if, with these proofs, he finds the suffocating heat which accompanies this wind, and the dryness which belongs to it, he concludes that the *Levanter* will soon be with him, although at the time the westerly wind may be blowing in the bay. The seamen also in the Gulf of Huelva, or off the Broa of Sanlúcar, know that the *Levanter* is blowing at Cadiz and in the Strait, when the sun at rising presents a white appearance, and the land is misty.

The light *virazon* is also a precursor of the *Levanter*. When it is found that this daily breeze begins to decrease in strength, and when at night hauling to the land it inclines more to N.E. than N.W., accompanied by some light broken clouds, it may be expected shortly. It may also be expected sooner when the heights of the distant mountains are distinctly seen. These same heights will remain clear while the wind continues to the N.E. or E. But as soon as their summits become clouded the wind may be expected to draw to S.E., which is the wind that soonest overcasts the sky.

The winds which preserve the clearest atmosphere are those from N.E. to East.

The barometer will also announce the easterly wind. A small de-

phere, although his own filaments might prevent his too rapid descent, enough for us that those filaments produced by it do so. Therefore we shall not endeavour to answer the gentleman's question, but it would occur to any one that a spider may be blown off a neighbouring tree, or he may be lifted in the air by a breeze of wind seconding his own exertions in the way of soaring. But in the violence of the West India "norther," or the South American "Pampero," the searching strength of the wind would dislodge those filaments from every recess, even in the ground to which it would penetrate, and the extraordinary masses of the spider's thread collected by the wind would be accounted for by the encouraging effects of the warm climate so favourable as it is to insect life. But the strength of those winds is not essential to the presence of the phenomenon for we read here that they are also swept from the plains of Andalusia by the east wind. The ordinary N.E. Trade would carry them westward away from the Gulf of Mexico, where they are met and considered as a sign of the norther, the atmosphere then having a tendency to flow southward to the gulf. Thus then to complete the phenomenon we first have the abundance which will be favoured by the climate, then the soaring propensity of the insects themselves here supplied, and the irresistible violence of the wind to snatch the filaments of these insects from every possible hold they may have to leaf, flower, or weed, from which to carry them and to leave them on the resisting obstacles of yards, masts, and riggings of vessels to which the gale has brought them. Doubtless they are floating in the air and may have been left there by the insects themselves as we have seen above, or caught up in passing over their haunts. In conclusion, we may also remark that the accidental observation in the *Anuario* that they are never seen in the rigging of vessels at Algeciras confirms our opinion that they come from the ground and its belongings, being the produce of innumerable minute as well as large spiders, for the vessels there are to *windward* of them while those at Cadiz are to *leeward* with the *Levanter*.—ED. N. M.

pression of the mercury in the barometer, and a simultaneous rise of the thermometer are indications of the quick approach of that wind; but as soon as it has set in, the mercury of the barometer again rises.

After the *Levanter* has been blowing for some days, especially in summer, if the barometer is found to rise, it may be expected soon to cease, even if it be blowing in heavy squalls. And, in fact, it will be gone the next day, and succeeded by the wind from the opposite quarter, and this is only violent when it sets in against it.

Westerly winds: These winds alternate with the *Levanter*, and consequently blow in all seasons. They are distinguished by their healthy influence on the animal system, their freshness mitigating that heat and dryness which are the effects of the *Levanter*.

These westerly winds have an entirely opposite character to the *Levancers*. They are moist and generally accompanied by clouds. They never blow so hard as the *Levancers*, nor are they so persevering; and generally slacken or go down with the sun.

In winter time when these winds draw to S.W. they bring heavy clouds and showers which expend themselves in wind as well as in rain, in a manner so as to obscure the whole coast; still between the showers there are in general sufficiently clear intervals that enable the navigator to make his easting for the coast. If they draw to the N.W. they are clearer and generally last for intervals of eight or ten days.

Signs of the Westerly Winds.—The approach of the westerly wind is marked by dews. If in the interval of the Easterly wind, at night or early in the morning, moisture is seen on the different parts of the ship proceeding from the dew, it will soon terminate to be followed by the westerly wind.

Veering of the Easterly Wind by the South to West.—In general before the west wind is set in it will gradually lessen in force and veer by S.E. and south to S.W. accompanied at the same time by a fall in the barometer. If this should happen in winter the sky begins to become overcast as soon as the wind gets to S.E.; it blows from this point for one or two days, the barometer continuing to fall, and it finally becomes south. As soon as it gains this quarter the sky is entirely overcast, then the wind freshens up and changes to S.W. accompanied by heavy clouds and constant rain. In this state of the weather it is that the barometer is lowest, and the wind may be soon expected to veer to west if the barometer has a tendency to rise and the rain becomes less frequent.

On the coasts of Huelva and Cadiz the East and West winds divide the year between them. It should not be supposed, however, that the easterly are more persisting than the westerly winds. The last prevails perhaps more than the former; but as the east wind is the scourge of Cadiz Bay and its vicinity, while the westerly wind mitigates and cools the atmosphere which it brings, a single day of the Easterly wind is more notable, and in fact, more feared than a week of the Westerly wind.

The annexed table will afford conclusions which will corroborate what we have stated.

Class of Wind.	Number of Days of each Wind.					Total Days of each Wind.
	1856	1857	1858	1859	1860	
Calms	0	1	2	1	1	5
Light Variable ..	19	16	4	28	20	87
North	2	6	13	5	8	34
N.N.E.	14	11	11	13	12	61
N.E.	14	16	15	22	12	79
E.N.E.	4	9	10	9	2	34
E.	76	72	50	46	53	297
E.S.E.	6	11	17	3	5	42
S.E.	12	13	9	16	16	66
S.S.E.	3	3	5	2	..	13
S.	14	16	18	6	9	63
S.S.W.	12	14	6	6	6	44
S.W.	28	27	35	27	30	147
W.S.W.	35	29	38	46	40	186
W.	27	31	22	27	26	133
W.N.W.	26	27	18	23	40	134
N.W.	70	55	84	79	81	369
N.N.W.	4	8	8	6	5	31

RESULTS.

Number of Days N.	34	..	Number of Days of 1st quarter	471
" S.	63	..	" 2nd	184
" E.	297	..	" 3rd	512
" W.	133	..	" 4th	568

Days of East Wind during the five years .. 373

Days of West Wind .. 455

This table has been formed from the daily official journal kept in the tower of Tavira, and the wind has been taken at noon of every day and considered definitively established.

It will be seen from the above table that westerly winds, or those between W.N.W. and W.S.W., much exceed those from the eastward or between E.N.E. and E.S.E., although the days of easterly wind surpass considerably those of westerly wind. This must be attributed to the fact that the winds from the third quarter (or S.W.) are always more lasting than those of the second (S.E.), as those of the fourth (N.W.) are more so than those of the first (N.E.); consequently the west which participate with S.W. and N.W. have a great predominance over the easterly winds which participate with opposite points N.E. and S.E.

N.W. Winds.—The winds which also prevail much at Cadiz and its vicinity are those of the fourth quarter, and of these, those from N.W., which circumstance arises, in our opinion, from that bay being situated

at the eastern limit of the Gulf of Huelva, in which those largish rivers, the Guadalquivir and Guadiana fall, besides the Odiel and the Tinto.

S.W. Winds.—Next to winds of the fourth quarter, those of the third may be considered to predominate, which are those that bring the storms and rains of winter, and are the same in summer that constitute the *Virazon*.

Norther.—Northerly winds blow but little, and when they do, generally in the winter. They must be considered as land winds, and always incline to the N.E. in the Mediterranean if the easterly winds prevail, or to the N.W. if in the ocean with a westerly wind. The winds of the first quarter (between north and east) are the least violent and mostly attended with clear weather.

Southerly Winds.—Nor do southerly winds blow much, for in winter time they soon haul to S.W., and if in summer they form part of the *virazon* and are transitory.

Although the *Levantes* will prevail at all times of the year, they do so more in the months of March and April and in the hot months. In July, 1856, there was a whole fortnight of continuous easterly winds, and also in August of that year.

The N.E. winds, as we have seen, were the most persisting, and prevailed from March to September, blowing hardest in April and May.

From November to March, or in the winter months, the S.W. winds were the most prevalent; and they certainly are the winds most to be feared in the Gulf of Cadiz, for besides blowing strong, they bring heavy and constant showers which conceal the land and throw in so much sea, that all the bars even become impassable. These winds called *Vendavales*, vary between W.S.W. and S.S.W. Fortunately they give notice of their approach, and the navigator who may either be cruising off Cadiz or to the westward, sees its approaching signs and can get clear of the shore to the parallel of the Strait, and if necessary he can always be sure of the Strait.

Signs of the Vendaval. The *Vendaval* gives unequivocal signs of its approach. If the easterly wind be blowing it will veer to the S.E., the sky will become obscured and the coast concealed, especially the Broa of Sanlúcar, and the wind may be expected from the southward with rain, and soon the *Vendaval* will follow. This change is always preceded by a considerable fall of the barometer.

A calm and a dense fog are always signs of the *Vendaval*. In winter after the *Levanter* has been blowing if it draws from S.E. to south, and it continues so with light misty winds, a gale may be expected from the offing. Vessels should be careful not to encounter the *Vendaval*, not only on the dangerous coast between Point San Sebastian and Cape Trafalgar, but also within the Gulf of Huelva. On the first of these parts beset with reefs, the sea breaks at a great distance from the shore, and it often happens that breakers are seen before the coast is visible. In the second portion of coast, a vessel runs great risks, for in the breaking sea which is raised

by the gale in addition to this there is a set towards the shore ; and if the navigator should not have sufficiently foreseen this, so as to provide for getting away from it, and becomes hampered with it, he may reckon himself fortunate if he be not wrecked on the Arenas Gordas. On that portion of coast between Cape St. Mary and Cape St. Vincent the risks are not so great, for with the wind at S.W., a vessel can escape by standing off S.E. unless the wind be so strong that with it and the sea she cannot weather Cape St. Mary.

In respect of the coast of Africa included between Cape Mazigan and the Strait, there is not so much risk there with the *Vendaval*, because the land trends much in its direction and it has no great sinuosity. The worst winds on it are from West to north-west, and with these a vessel should take care not to risk her safety in Jeremias Bay. What is most to be apprehended in this part is the sea which gets up always, which in a gale on shore will very soon lose a ship and her crew, should she unfortunately in the thick weather of the *Vendaval* mistake this Bay for the entrance of the Strait, a mistake indeed which has been fatal to many vessels.

Veering of the Vendaval. Although usually the *Vendaval* does not last above three days, sometimes it is stubborn and will continue for nine or even twelve days with but slight interruptions. If after blowing strong it veers to west, fine weather may be looked for, because it does not remain long at this point, but hauls to N.W. which is generally the concluding quarter of the gales in our hemisphere, and is that which clears up the atmosphere. But if from west it returns again to south-west the bad weather will begin afresh, and the wind will blow harder than before although it may not last so long. But when it becomes steady at N.W. it very seldom backs to S.W.

The wind once established at N.W., for some days it may blow hard but then will become more moderate and is almost always attended with clear weather, although blowing harder by day than by night. If it change to north afterwards, it seldom remains so long, for it will pass to N.N.E. and then to N.E., where it will remain for some days more. This wind is always the precursor of the *Levanter*, north-east and Easterly winds in the Gulf of Huelva. In winter time in the Gulf of Huelva N.E. winds are the almost certain sign of the *Levanter* blowing at Cadiz and in the Strait of Gibraltar, as the N.W. winds are of there being a westerly wind on the south coast of Portugal. In this Gulf of Huelva, far enough from the Strait, the *Levantes* are not so fresh nor yet so lasting : they sometimes take two or three days to reach Huelva, and die away here before they cease at Cadiz.

Baffling Winds. When the *Levantes* enter the Gulf they do so by fits and starts, and are preceded by light baffling winds from all parts of the horizon that are called *Macareos* by the Spanish sailors. If these baffling winds are attended by a suffocating heat in summer time, the *Levanter* may be expected, which generally lasts some days when once it sets in, blowing hard as if it was from S.E. while the sun is

high and drawing to N.E. at night with fine weather. But in summer in the Seville river their heat is intolerable.

In winter time in the Gulf of Huelva the continuance of the northeasterly wind is generally considered a sign of the *Vendaval*, and as soon as it passes to the eastward this terrible wind may be expected, for then it soon becomes S.E. and shifts to south and S.W. As soon as the wind begins to veer thus, and the barometer falls, a vessel should get out of the Gulf as soon as possible into deep water, and avoid compromising her safety by getting hampered with the Arenas Gordas.

It frequently happens that while these changes are going forward in the Gulf, at Cadiz and in the Strait the *Levanter* may be blowing, and on the coast of Algarve the westerly wind. When mist is observed over the entrance of the Strait the *Levanter* may be known to be outside, and the westerly wind prevails at Cape St. Vincent when the Portuguese land is clear or if the mist be seen at the mouth of the Guadiana.

Old sailors who know the Bay of Cadiz and its neighbourhood, have an idea that the climate of those parts has undergone a change of late, an alteration which they consider extends even to winds and storms. They consider that of late, storms are scarce in comparison with those of former times, when bad weather commenced in September and lasted until the Spring; storms following each other with scarcely any intermission.

It seems that the general tendency of storms now almost as soon as they are established is to slacken, and not to last any time. But at any rate both in Summer and Winter the wind is more variable, and it is seldom observed the same wind will last for fifteen days together as in their opinion it used to do formerly.

Storms scarcely ever get up on the coast of Cadiz, but come from other parts more or less distant. A storm at Cadiz where it is remarkable for the force of the wind, is soon over, and in general bad weather comes from the S.E., a quarter from which the wind is much stronger than from the east.

DEFECTS OF THE PACIFIC CHARTS.

We have received for publication in these pages the following important communication from Mr. J. B. Steele, the master of the ship *Sebastian Cabot*, of Liverpool. In reference to the Stewart Islands, which he places in North latitude instead of South, he will find a very good account of them given by Captain Cheyne, on his passage from Sydney to China. It is an addition to what was stated of them in this work so long ago as 1848 (see p. 575), quoted since by Findlay's Directory of 1851, with acknowledgment and repeated in his edition of 1863. (What has Captain Steele been doing with his eyes in all

this time?) In another number we will quote Captain Cheyne's account of them. Their discovery is dated in 1791, but their position is due to Krusenstern. In regard of Isle Saypan of the Ladrões or Marianne Islands, we can refer him also to our translation of the Spanish description of it in our last year's volume, p. 297, *et seq.* At the same time the Spanish officer who describes it holds out no hopes of those resources which seem to have disappointed our correspondent. His chart appears by our last vol. (p. 688), to be published by the Admiralty, which charts our readers know are to be had of Potter, 31, Poultry.

The position of the Douglas reef is a very fair confirmation of the chart, and the remark on Rasa is very important, as well as that on the Tradé in that Western part of the Pacific.

The Loo Choo Islands want a thorough examination before any pretensions can be made to a good chart of them.

It is highly satisfactory to record Mr. Steele's ideas on the duty of making known these observations. It was for that purpose this work was established many years ago; and we trust that he will not only persevere in his views of communicating them, but induce his brother seamen to do the same.

To the Editor of the Nautical Magazine.

Shanghai, 20th June, 1867.

SIR,—I beg to offer you for publication in your valuable Magazine an account of the Stewart Islands, which I have no doubt will benefit vessels passing in their direction, and more particularly those which unfortunately may be wrecked on or near them. From the accounts of the savage nature of those natives of the Solomon Islands, and others in their vicinity, the crews of such vessels may be afraid to land on the Stewart Isles, as the very meagre and unsatisfactory descriptions of them and their inhabitants, given by the sailing directions, do not encourage them to do so.

The ship *Sebastian Cabot*, of Liverpool, under my command, called at the Stewart Islands, situated in lat. $8^{\circ} 26' N.$, long. $163^{\circ} 2' E.$ on the 16th of May, 1867. They consist of a group of four islands, connected with each other by a coral reef. They are very low and covered with trees, and cannot be seen in clear weather at a greater distance than twelve miles. The largest island is about a mile and a half long, and the total of the inhabitants of the group is less than two hundred. A number of the natives came off to the ship in canoes, resembling in every particular those used by the Cingalese.

They are a very fine, stout, and good looking race of men, their colour is tawny with black hair, they are extremely simple in their behaviour and their dealings. They brought on board for exchange a quantity of fowls, ducks, pigs, cocoanut oil, etc. Tobacco was the great object of their wishes, and they deal very liberally. Knives, fishhooks, and needles were among their wants which we supplied. One of the natives had a book in which was inscribed, by their respective names,

the names of all vessels that had visited the islands for some years, and from this it appeared that twelve months had elapsed from the date of the last, which was a whaler. All the natives speak English pretty well, but one of them who seemed very proud of his attainments, repeated the alphabet very correctly. This man had in his possession a certificate which was granted him by the master of a vessel in testimony of services rendered in refitting, and for the hospitality and attention shown to his crew who were sick, and who remained on the island some weeks to recover. Not the slightest apprehension of hostility need be entertained in landing here. Indeed, parties coming here from wrecked vessels, or from those in any kind of distress may be certain of being relieved, and their wants attended to by these well disposed and humane, but very primitive people.

LADRONES, RESOURCES OF.—Isle Saypan.—Having been deceived by the directions with regard to the Isle of Saypan (one of the Ladrões N. Pacific), which I was induced to visit through statements of the ease with which they alleged supplies were to be obtained. I am inclined to send you a few particulars which may be the means of preventing others from being misled in the same way. The ship *Sebastian Cabot* sailed within five hundred yards of the shore where it was described that a good anchorage existed, but nothing could be more erroneous. There is no opening in the reef which lies N.W. of the island, nor was there any point of approach along the shore which we could discern. The above reef extends along the coast about ten miles in a N.W. direction. A number of boats crowded with men were engaged fishing inside the reef; but paid not the slightest attention to us, nor did they shew the least sign of coming off to ascertain our name, so as there were no means of our communicating with the shore, we proceeded on our course.

According to my observations the N.E. point of the Island of Saypan is in lat. $15^{\circ} 16' 30''$ N., long. $145^{\circ} 50'$ E.

DOUGLAS REEF.—*Position.*—Having sighted Douglas Reef N. Pacific on the morning of the 10th June, 1867, and finding a difference in the position and the description given by Mr. Sproule, of the ship *Marie*, in 1848, from the "China Pilot," fourth edition, 1864, I beg leave to state that it is a reef extending in a W.N.W. and E.S.E. direction for five miles. Two isolated rocks near its western end, the westernmost about twenty feet the other about fifteen feet above water, distant from each other about a quarter of a mile.

The position by excellent observations of the westernmost rock I made to be long. $136^{\circ} 17' 15''$ E., lat. $20^{\circ} 28'$ N. It is a very dangerous reef in stormy or cloudy weather, as it can be seen but a very short distance.

By inserting the above you will much oblige,

Your obedient Servant,

J. B. STEELE,

Master of the *Sebastian Cabot*,

From Sydney,

Bound to Shanghai.

RASA ISLAND.—On the 13th of June, 1867, we passed over the position assigned to Rasa Island (viz., lat. $24^{\circ} 27' N.$, long. $130^{\circ} 40' E.$), but saw nothing of it. A sufficient proof that it is not situated in the above position.

EXTRACTS UPON THE WEATHER.—On the 26th of May, from lat. $30^{\circ} S.$, we crossed the equator in long. $158^{\circ} E.$ with a steady S.E. Trade wind. Got the N.E. Trade winds in lat. $1^{\circ} 40' N.$, carried them steady at E.N.E. to the Ladrões, from thence to the Loo Choo Islands (15th June). Experienced a steady S.E. wind resembling a Monsoon or Trade wind with beautiful clear weather. Judging from what we experienced since leaving the Ladrões, as the S.E. wind has been so steady, I am of opinion that either a Monsoon or Trade wind does exist here. As I consider commanders of vessels navigating these unfrequented seas would do well to take notes of the positions of islands, shoals, weather, etc., and forward them for publication, which would be of great benefit to the shipping community, I send you the above Extracts.

Yours respectfully,

J. B. STEELE,

Master of the *Sebastian Cabot*.

LOO CHOO GROUP.—P.S. 15th June, 1867, I made the positions of the under mentioned Islands to be, viz.: Yori Sima, N. Point, lat. $27^{\circ} 4' N.$, long. $138^{\circ} 36' 30'' E.$ Yeirabu Sima, S. Point, lat. $27^{\circ} 24' N.$, long. $128^{\circ} 46' E.$ There is a clear passage between them twenty miles wide. We experienced a current setting to the S.E. at the rate of one and a half miles per hour, causing strong eddies and rippings in the channel. Wind variable from the S.E. to S.S.W., with light showers of rain and cloudy weather.

J. B. STEELE.

[We hope to hear again from our correspondent.—ED. N. M.]

NETHERLANDS.

(Concluded from page 483.)

Schermerboezem.—With the aid of these preliminary remarks, the following more detailed account of one of the numerous water administrations into which this kingdom is divided may perhaps be rendered comprehensible.

The administration here selected to exemplify the multiform and ingenious contrivances invented by the Dutch for the control of large bodies of water is called the "Schermerboezem," in the Province of North Holland; it lies between the Zuyder Zee and the dunes, and is thus exposed to the national danger of submersion on the one side, and protected by the national defence upon the other. It contains the

Alkmaarder Meer, and is bounded to the south by the river IJ, thus having to guard against attacks from inner and from outer waters. It is important in area and fertility, and possessing to a large extent the leading features of the Netherlands, appears well fitted for an illustration of this subject.

To the Schermerboezem belongs the most extended polder system in North Holland. The whole tract of country thus parcelled out into polders, with their boezems bears the name of "Kavel Waterland" (literally translated "group of water-land"), and by this appropriate name it is designated by the Waterstaat, and minutely described by Mr. G. de Vries, Member of the Council of State, in his work, published in 1864, on the Sea Defences and Water Administration of North Holland. From that interesting work, and from the nine as yet published sheets of a very beautiful hydrographical map of Holland, now being brought out by Government on the large scale of 1 in 50,000, or in round numbers, one and a quarter inch to the mile, the details that follow have mainly been extracted.

Extent of Kavel Waterland.—Kavel Waterland includes all lands and waters lying between West Friesland to the north, the line of the dunes or sand-hills to the west (here forming a barrier against the German Ocean of between one and two miles in width, and eighteen feet in height at the lowest point), the river IJ to the south, and the Zuyder Zee to the east.

The area of Kavel Waterland may be roughly stated at 240 square statute miles, of which not ten square miles are occupied to-day by the boezem and canals. The Schermerboezem itself contains 5,000 acres of water, and the polders belonging to it contain in all 193,750 acres.

This tract of country formerly contained a chain of stormy lakes, which often overflowed in wet seasons, and joining one another, formed vast inland waters, ruinous to agriculture, and threatening to the dykes that alone separated them from the dreaded Zuyder Zee. The principal of these lakes were the Beemster, the Purmer, the Wijde Wormer, and the Schermer. These four alone, when at their lowest level, covered two-thirds of Kavel Waterland. Towards the end of the sixteenth century, however, man began to get the upper hand of them, and their conversion into polders was happily completed in 1612, 1622, 1626, and 1635. The first of them, the Beemster, is, after the Haarlemmermeer Polder (which is twice and a half its size), the largest specimen in the Netherlands of what the Dutch term "dry-makings." The scheme was first broached in 1570. In 1592 funds were applied for, which were not, however, promised by the States of Holland and West Friesland until 1597. In 1607 a company was formed at the Hague by Dirck van Oss and others to pump out the Beemster in whole or in part, and on their security the states lent the necessary capital on May 21, 1607. At the commencement it was thought that sixteen windmills would suffice for the undertaking, but this number was shortly increased by ten, and the twenty-six mills were then divided into thirteen gangs. By the end of 1608 several of the mills began to pump and early in 1609 they were all ready.

Towards the end of this year the bottom of the lake became visible in some places, but during a storm on the 23rd of January, 1610, the great waterland sea dyke gave way at Durgerdam, and the pressure on the ring dyke that had been constructed round the Beemster proved greater than it was capable of resisting. It gave way in two places, at Neck and at Ryp, and the lake was again filled.

On the 15th February, 1610, further and ample funds were advanced by the States; in 1611 more mills were put on to the work; on the 19th May, 1612, the drymaking was at last completed; and on the 30th July of that year the distribution of the lots of land redeemed took place at the town of Purmerende.

The number of mills working in the different years was as follows:—

		MILLS.			MILLS.
1608	..	21		1611	.. 41
1609	..	26		1612	.. 43
1610	..	30			

The mills were latterly divided into twelve gangs, that is, worked at twelve points. The ring dyke is over 37,000 yards long, and has an average height of + 1.50 Z. P. (a mètré and a half above the mean level of the sea).

Thus was the Beemster pumped out; and from that day to the present the name of Dirck van Oss has been held in deep respect in Holland, as the name of the first Dutchman who conquered the waters on anything like a large scale. The system he employed has been closely followed in all successive undertakings of this kind, and, with the exception of the application of steam and certain improvements in machinery, the plans of Dirck van Oss for draining the Beemster were adapted the other day with a like success to the lake of Haarlem by M. Gevers d'Endegeest, the hero of this last conquest, and the sanguine prophet of the ultimate reclaiming of the Zuyder Zee.

Distribution of a Drained Lake.—When a lake has been laid dry and its acres divided among the shareholders of the undertaking, its area is next subdivided into parallelograms, often not larger in extent than an acre a-piece, and separated from each other by what are known, in the phraseology of Dutch agriculture, as primary canals. Such a ditch, for in reality it is little more, performs the following four important services. The parallelogram is drained into it in wet seasons, and irrigated from it with facility in times of drought. It forms a water highway for the small canal boats that in this country take the place of the tumbril and the waggon of Old England, and finally it answers all the ends of quickset hedges as barriers for fields and properties, while tending by its presence to fertilize and not impoverish the soil. According as the circumstances of the ground (such as the level drainage, etc.) require, a dozen or more of these parallelograms are told off by the Waterstaat as forming a little group by themselves, and are compelled to pump their superfluous drainage into, and take their irrigating water from, one or more transverse

canals of a higher water level, which again communicate in their turn with the main outlets to the sea. In the Beemster polder there are no less than four canal systems of different water levels, through all of which every drop of water must pass in the course of its conveyance to or from the ring dyke by which the whole system is surrounded.

Ring Vaart.—This ring dyke is invariably constructed in duplicate, with an intervening space of from fifteen to twenty mètres, and a navigable canal is thus formed, on the banks of which the waterworks are erected, and into which the water from the lake is discharged. Now, in the group of drained lakes known as Kavel Waterland, these “ring vaarts,” as they are called, have been connected with one another by several canals, the waters of which can be cut off at pleasure at certain points by means of locks and sluices, according to the demands of agriculture, navigation, and the variable land. This great arterial system is in reality the Schermerboezem proper, and the ring vaarts of the Beemster and the Schermer, to the south and south-west respectively, have been widened and deepened so as to form important links in the great North Holland Canal, the water highway by which Amsterdam is connected with Helder by a direct line of inland navigation.

North Holland Canal.—The proportions of this work may be realized from the fact that it was constructed to admit of line-of-battle ships passing one another at any point along its length. Possessing, moreover, as a boezem-water, a common level throughout its length, its navigation is relieved from the usual tedious interruptions of multiplied locks and sluice gates. Further an idea may be formed of the character of the whole work from the knowledge that this canal has been built up, not made by digging, and that this enormous volume of artificial water, though lying considerably below the mean level of the sea, is lined throughout its almost entire length by drained lakes, lying from one to four mètres below itself.

The exact level of the Schermerboezem proper is — 0.56 Z. P. in summer, — 0.40 Z. P. in winter, and — 0.90 Z. P. when at the lowest point it is allowed to attain.

Height of Dykes.—The following table, from the careful work of Mr. Vries, already quoted, is not without interest as illustrating the nicety and accuracy with which the operations of the Waterstaat are conducted. From it can be seen at a glance the various levels of some of the more important dykes and piers that protect the eighty-one polders dependent on the Schermerboezem in the administration of Kavel Waterland.

Schermer ring dyke	..	..	..	+1.00 Z.P.
Beemster	..	..	..	+1.50 Z.P.
Purmer	..	..	..	+0.20 Z.P.
Wijde Wormer	..	..	..	+0 07.5 Z.P.
Zaan Nanwernasche vaart	..	..	..	=Z.P.
Marker vaart	..	..	..	+0.10 Z.P.

(To get the total height of these dykes, the depth of the polders

below the level of the sea must be added ; it averages perhaps fifteen feet over all.)

Level of Polders.—The eighty-one polders thus protected from inundation—from the rupture of a sea wall or the overflow of a boezem—lie mostly three or four mètres below the level of the sea, and two or three mètres below the level of the boezem into which they are pumped.

Thus the drained Beemster is divided into the following principal polders, lying at the following depths below the sea :—

Boven polder	..	containing	4,375	acres	—4·00 Z.P.
Arenberg polder	..	..	4,487½	..	—4·27 Z.P.
Kruisoord polder	..	..	117½	..	—1·50 Z.P.
Lage kilpolder	..	..	2,187½	..	—4·35 Z.P.
Midden polder	..	..	5,312½	..	—4·05 Z.P.
Hooge kilpolder	..	..	1,162½	..	—4·13 Z.P.
Total	..	..	17,642½		
Add for roads and canals	..	..	19½		
Total acres within ring dyke .. 17,662					

Salubrity of.—Once finally drained, these polders are not found to leak by percolation to any considerable extent, and the ordinary rainfall during autumn and winter is seldom more than is advantageous to the ground, and can be pumped out by the ordinary windmills before the 1st of May. Neither does experience show that polders form unhealthy residences. All the great lakes that have been drained have become densely inhabited ; and although the flat-roofed farm-houses with which they are dotted have been compared by travellers to mushroom rooms that have sprung up amid the tufted vegetation surrounding them, the born inhabitants are forgetful of the factitious nature of their soil, and prove satisfactorily by statistics that the conditions of existence they enjoy are not detrimental to mankind.

The details above given are all applicable, *mutatis mutandis*, not only to the polders formed by the draining of the lakes, already mentioned as comprised in Kavel Waterland, but to all reclaimed ground in the Netherlands. Everywhere the same windmills greet the eye, all performing the same task of pumping up water from the polders into the boezems during a period of at least half of each year.

Application of Steam.—Steam power is of very partial introduction, that is to say, it is confined to some few large and recent operations, and to a very few strategic points, such as the abutting of a boezem of a low level on the sea, in which case the work of discharging water is enabled to continue when high tides or prevailing unfavourable winds have compelled the closing of the sluices. These sluices invariably open towards the sea, and thus shut and open naturally and at the right time, according as the pressure comes from within or from without. They are always remarkable for solidity, and often of magnificent proportions. The application of steam, as above stated, is still of

necessity confined to some limited administrations, where the waters do not exceed a volume that can be grappled with and reduced in a short period—say a week at most—and where, moreover, the land is of that valuable nature, or the valuable crops are so endangered, as to make it worth while to consume fuel rather than patiently await a return to favourable conditions.

Water-mills.—In some districts, where the soil is highly charged with silt, the Scoop or Eckhardt wheel is used in preference to the Archimedes screw pump; and as the water seldom requires to be lifted more than a mètre at a time from a lower into a superior tier of canals, almost any form of water-wheel can be easily applied, and turned by the construction of the simplest windmill:—

“It is easy to conceive the extreme fertility acquired by land managed in this manner. Formed originally of mud, which was itself rich, it is covered all the year round with herbs which contribute to its fertility. All the water that is injurious is drawn off almost at pleasure, and a regular and gradual irrigation is introduced at the most favourable moments.”

Taxation of Polders.—Yet this extreme fertility does not all represent net profits to the proprietors or farmers of the soil. Taxes for the support of the Waterstaat are heavy, and must be paid to keep the country above water. These taxes form no exception to the general rule in such matters, and assume the well-known shapes of charges direct and indirect. The direct, average perhaps eight florins per acre on land that has been reclaimed, and the indirect, include forced labour “for a man’s own self” in perpetually ditching and dyking, if he will make the most of what may be called his unnatural advantages. The dunes, moreover, which ensure safety on one side at least, require to be kept in order and carefully watched. They are composed of fine sea-sand heaped up like the hills of the desert, and their tendency is to blow inland and smother the alluvial soil. To provide against this contingency every kind of herb that can be induced to take root in the shifting sand is planted at those strategic points where the wind catches the corner of a sand-hill, and bent grass is trained with care and great expense along the coast from Texel to the Scheldt, forming what may be called an inner line of coast defences against the fury of the elements.

Nothing would be easier than to prolong this Report to an indefinite length by describing in minute detail the administration of Rijnlands-boezem, of Raakmatsboezem, of Amstellandsboezem, of the boezem of Naardervaart Karnemelsloot, of the Vecht, and of the town water of Amsterdam, with all of which the maps of Mr. Conrad have now for the first time made the public acquainted. Such a description, however, would only contain needless repetitions, as the features with which we are now familiar would but repeat themselves from different points of view, with some unimportant variations of the plus and minus quantities. It will therefore be enough to state that the experience of the Dutch in controlling the waters, and converting natural enemies into priceless auxiliaries for the ends of agriculture,

navigation, and military defence, is now at the disposal of the public on payment of rather more than one pound sterling.

The publication of these maps was ordered by Mr. Thorbecke, when that statesman was last Minister of the Interior, and they are now being executed under the personal superintendence of Mr. Conrad, the chief engineer of the Waterstaat, assisted by Staff Lieutenant-Colonel Jacob Bessier. The military topographical maps of the Netherlands have been taken as a basis, and each sheet (costing about half-a-crown of our money) contains a map sixteen inches by ten inches, representing a tract of country a little over twelve miles in length and eight in width, with ample marginal explanations and descriptions of the nature of the ground and character of the works within those limits.

Colouring of Maps.—Additional clearness is given to these maps by the excellent system of colouring adopted. For example, the boezem of any given administration is coloured blue, green, or brown; the polders belonging to it being tinted light blue, green, or brown accordingly. Thus the colour of a polder always corresponds to that of its boezem, the only exception being in the case of polders that discharge direct into the outer waters, which are invariably of a brighter green.

Polders having no direct communication with their boezem but discharging into another (or administrative) polder, are surrounded by a narrow ring or belt of slightly darker shade, and a striped colouring is adopted in the case of polders discharging into two separate boezems, and thus belonging to two distinct administrations.

All ground of which the level is superior to the mean level of the sea is left uncoloured, and it is thus evident at a glance that the narrow dunes or sand-hills constitute the only natural land in the districts as yet illustrated by Mr. Conrad's maps.

Works, such as canals, in course of construction are indicated by dotted red lines; and reference to the maps shows that it is not deemed impossible to reclaim land lying at an average depth of seventeen mètres below the level of the stormy waters of the IJ, and that a canal is being constructed through the dunes to unite the outer waters of the German Ocean with the mart of Amsterdam, in order to save commerce from the danger and delay of the long circuit to the north by Texel, and also to provide for Amsterdam a direct outlet to the sea in the event of the execution, at a later period, of the gigantic project of the draining of the Zuyder Zee.

The maps above described appear at uncertain and irregular intervals. The two extreme northern sheets of the nine now published appeared but a few weeks ago, and it is known that several sheets are now prepared and ready to be given to the world, and are only awaiting funds, and leisure of the Hydrographical Department, to pass them through the press.

Before it is possible, however, finally to dismiss the subject under consideration, it is necessary to extend the area of these inquiries beyond the limits of the nine sheets of Mr. Conrad's maps, and of the six hundred and ninety-eight octavo pages of Mr. Vries' valuable

work on the Waterstaat of North Holland. It is necessary to cast a glance, however cursory and superficial, on the abnormal shapes assumed by the lands of Groningen and Drenthe owing to the constant excavations of turf during many centuries, and on those strategic lines of Utrecht and the Yssel, by which, in time of war, the Dutch hope to baffle the advance of the invaders of their soil.

Origin of Lakes.—From the consideration of polders and drained lakes, one needs to go but one step further back in history to find the causes to which these lakes owed their origin. The earliest reliable records that exist describe the Netherlands as “girt with forests.” “An extensive belt of woodland skirted the sea-coast, reaching beyond the mouths of the Rhine. The groves of Haarlem and the Hague are relics of this ancient forest. The Badahnena wood, horrid with Druidic sacrifices, extended along the eastern line of the vanished lake of Flevo. The vast Hercynian forest, nine days’ journey in breadth, closed in the country on the German side, stretching from the banks of the Rhine to the remote regions of the Dacians in such vague immensity that no German, after travelling sixty days, had ever reached, or even heard of, its commencement. On the south the famous groves of Ardennase, haunted by Faun and Satyr, embowered the country, and separated it from Celtic Gaul.” In the lapse of ages these forests became overgrown: the soil, rotten with fallen trunks and layers of fallen leaves, no longer afforded to the roots of oaks the firm support necessary for enabling them to brave the fearful hurricanes that swept over the land, and thus amidst succeeding storms and inundations these forests gradually disappeared, until now almost the only trace remaining of them is to be found in the vast peat fields that cover, more or less, the whole Kingdom of the Netherlands.

Extraction of Peat.—The use of this substance for fuel was known to the ancient Belgæ, whom Tacitus describes with pity as a people compelled to burn their ground for want of wood, and Pliny with admiration as a people who fished for fuel, with which, when dried by the wind rather than by the sun, they warmed their bodies benumbed with cold (“*rigentia septentrione viscera sua urunt*”). Thus the extraction of turf for fuel in Holland dates from the earliest times, though it was not until 1215 that the peasants of Friesland learnt to turn this gift of nature to the best account by chemical preparation. From that period till the present day, the consumption of turf in the Netherlands has kept pace with the increase of the population. In 1834 the annual consumption was 22,275,623 tons, and in 1852 this had increased to 33,943,630 tons. These figures are of interest when compared with the consumption of coal in the Netherlands, as showing that peat still holds its own for purposes of fuel, that notwithstanding the great quantities of coal now imported for manufacturing and domestic purposes the demand for peat is constantly increasing, and that this traffic is fifty times as active and extensive to-day as that in coke and coal put together.

The Government has, therefore, been compelled to step in to stay

the wholesale destruction of the Netherlands by fire, and the consent of the Waterstaat is now necessary before a proprietor may reduce the level of his land by cutting it up into bricks of fuel for the market.

There does not exist the shadow of a doubt that nine-tenths of the polders now drained and cultivated were once bogs and mosses, such as exist in Ireland and in Scotland, but for the most part situated so low that, the layers of turf removed, they rapidly became lakes, which irruptions of the inner waters often converted into inland seas. Then came the prevalent gales, heaping up the outer waters, as they often do in the course of a fortnight, ten and twelve feet above the highest spring tides known, the narrow rotten causeways protecting these inland seas would be swept away, and the result is visible to-day in the Zuyder Zee, the Lake of Haarlem, and the thousand other polders whose origin may be traced to early ignorance of water engineering, and the use of turf as fuel from a date antecedent to the Christian era.

Fertility of Exhausted Turbaries.—It must also be remembered that, besides the immediate profit to be derived from selling paternal acres by the square inch, the landlord might anticipate a more lasting gain from the fact that the removal of the layer of turf frequently exposed rich alluvial lands, which, when dyked and converted into polders, produced crops of potatoes, rye, clover, and buckwheat in rapid rotation; and this hope, though not always realized, has proved a great incentive to the excavation of peat.

In general, bogs or turbaries are known in Holland as “hooge” or “lage veenen,” that is, situated above or below the level of the waters. The former are naturally the most easily worked, as they may be cut out with a spade at discretion; while the latter require preliminary dyking and draining to let off the water before the fuel can be dug and prepared.

Historical Anecdotes.—Peat has played a part in Holland second to no other produce of that country; and the Dutch relate with pride that it has had its patriotic as well as its material uses. Their history contains two episodes in support of this assertion. The first occurred in 1593, when the Spaniards had with great difficulty constructed a chaussée to traverse some bog lands. This passage the Dutch had made impracticable for cavalry and artillery by felling trees and laying them across. Of this timber the Spaniards made a bonfire, which communicated to the causeway and surrounding turbaries, compelling the Spaniards to beat a hasty retreat, and thus raising the siege of some important fortresses. On hearing of this disaster, Philip II. is reported to have ordered that, “since Holland was combustible, it should be burned to ashes.”

The second story is as follows: “The impregnable town of Breda was occupied by the Spaniards and besieged by the patriots. Winter approached, and one evening a huge canal-boat appeared at one of the water-gates of the city laden with peat. The boat was joyfully admitted by the Spaniards as relieving one of their most pressing wants; the discharge of cargo was postponed till daybreak, but before midnight had tolled the boat-load of turf had proved itself a second

Trojan Horse, from whence eighty armed men issued, overcame the guard at one of the gates, and admitted the valiant Prince Maurice at the head of his army.

These services, besides its properties of giving out heat and light, its ashes affording rich manure, its soot being valuable for cleaning pots and pans, and its smoke for preserving fish and meat, have endeared turf to the heart of every peasant as an article of primary importance to the domestic comfort of his daily life.

The three northern provinces of Friesland, Drenthe, and Groningen, indubitably owe most of their well-being to their wealth in peat. There the proprietor of the soil, after exhausting one layer of turf, and reaping splendid crops without manure from the alluvial soil laid bare, often after awhile removes the alluvial soil to some neighbouring sandy waste, discovering under it fresh layers of peat, and still more alluvial soil. The depth to which cultivation is thus carried by successive removals of peat and soil often exceeds twenty feet; and no truthful estimate can be formed of the original face of nature by the study of the present features of a Netherland's landscape.

Floating Turbaries.—In the three provinces above-named, but especially in Overijssel, one last phenomenon occurs which calls for some remark. This is the existence, now rare however, on the borders of large lakes, of floating turbaries, bits of which may be cut off in strips, according to the width of the canals they have to traverse, and floated down to market. Many legends are told of the embarrassments these floating turbaries have caused. Many a farmer has been compelled to tether his fields to prevent their floating away; and when desirable to keep flocks and herds separate, these fields have been pushed off from the shore, and anchored at a distance. Then perhaps a storm has suddenly arisen, the fields have dragged their anchors, and floated out to sea.

Such incidents are now of rare occurrence, but it would not be difficult to make a collection of well authenticated tales of a similar description that would strike astonishment into the sober minds of English husbandmen, as tending to convert the laborious and practical profession of a farmer into a life of fable and excitement.

Having now examined briefly in their varied shapes the defences by which Nature and the hand of man have made the Netherlands sufficiently watertight for the support of life, it is time to inquire what is the truth respecting the much vaunted lines of Utrecht and the Yssel, to which the Dutch trust for protection against the aggressions of their fellow-men.

Lines of the Utrecht and the Yssel.—One glance at the map is, however, unfortunately sufficient to show that the confidence which familiarity with the practical meaning of the word "inundation" has engendered in the liberty loving Dutch, appears to be somewhat overweening and of but partial application. For of the eleven provinces constituting the Kingdom of the Netherlands, three only, viz., North Holland, South Holland, and Utrecht lend themselves to this defence. In other words, of the 12,623 square miles and 3,600,000 souls

included in the Netherlands, only 2,666 square miles, and 1,412,000 souls, could under the most favourable circumstances be protected within the lines of practicable defence by flooding.

In the important category of favourable conditions for flooding these lines, moreover, the state of the ungovernable elements largely enters; and although history teaches that in former times these have often been of incalculable service to the Dutch when defending themselves against the relentless Alva or the chivalrous Alexander Farnese, yet it must be remembered that the dilatory warfare of that date is incomparable to the celerity with which the Seven Days' War has made the world familiar.

To the lines of Utrecht and the Yssel no great mystery attaches. They are visible to the eye of any engineer travelling through the country. There has been a great abstraction of peat, and the level of the land is in consequence extremely low. Direct communication with the Zuyder Zee, with the German Ocean, and with the minor waters of the Old and New Rhine, and Maas, the Waal, the Leek, and the Yssel would appear at first sight to offer an abundant, if not inexhaustible, supply of water; but so great are the existing precautions against inundation from these very waters, that it is calculated a week would be required by the Waterstaat to cut the dykes and remove the obstacles to their free entry. Further, even supposing the invaders had permitted this work to be accomplished in the specified time, a low level of the inner waters and prevailing easterly winds might indefinitely delay the fair accomplishment of the scheme.

In addition to the great strategic lines above mentioned, almost every Dutch fortress has a local flooding system of its own; but a kingdom containing, according to the last census, but 1,748,163 males, men and boys, cannot, in the presence of the large standing continental armies of to-day, even undertake to defend too long a line of frontier. This is the argument that has prompted the decision recently taken, of which no secret has been made, to raze the frontier fortresses, and, in case of need, to concentrate the whole resources of the country for the defence of Holland Proper, whose absolute independence is so dear to every Dutchman.

NOTES DURING A VOYAGE BETWEEN ENGLAND AND THE BLACK SEA.

A SHIP steering for Cape Bon from the westward through the inner Skerki channel towards nightfall, will sight the Island of Zembra, and be in danger of mistaking this for the Cape, on account of its height not being mentioned in the "sailing directions;" an omission and neglect, which has led to vessels hauling into the Bay of Tunis at

night, under the impression that they had cleared Cape Bon, and had a clear sea to go south of Pantelleria. This occurred to a ship while we were off the coast, and was a narrow escape from disaster.

The error is to be avoided by remembering that the Island of Zembra is *high*, and when approached from the westward is seen long before Cape Bon comes into sight.

Compilers of "Sailing Directions" would do well to bear in mind that they cannot be *too particular* in their directions, for it frequently happens that an apparently *trivial* remark enables a captain of a ship to determine his position in a moment of danger, and so enables him to avoid disaster.

2.—The advantage of going *south* of Pantelleria Island especially in the night, is that all is clear there, so that if the wind falls light or comes from the eastward, which is sometimes experienced, after clearing Cape Bon, you are not near any danger as in the passage to the north. The small Island "Linosa," south of Pantelleria is not so small as it appears on the chart, and here again its speciality of a hummock near each extreme which makes it look like *two islets* where the connecting low land is below the horizon, might be usefully noticed in the sailing directions; for how often before thick weather or before nightfall does the safety of a vessel depend upon a single hasty, but *well identified* spot to which to refer to for fixing her position.

There appears an advantage in going *south* of the Maltese Islands, from the circumstance of the S.E. winds being the most severe in the Mediterranean, a ship is more to windward.

3.—Ships from the westward approaching the Archipelago at night, if they lay to until daylight, which is advisable if it be dark or thick weather, may enter any one of the three channels off which they happen to be in the morning; for the determination to enter by any particular channel often leads to loss of time. During the time we were in the Archipelago (early part of January) the current set steadily to the south at a rate of about twenty miles a day; and off the Island of Georgio, where a boat was lowered to try the rate and direction of the current, it was found to be southerly one and a quarter knots.

Kanavi "Island," as it is called in the book of directions, is nothing more than a small bare rock, and it would be better that it should be called so, or a rocky islet, as ships at night would be looking out for what is not to be seen—an *island*.

4.—Bound for the Dardanelles, I prefer the passage outside of Tenedos, and if the wind be northerly, it is certainly better to beat up close to Imbros, and steer from that island, keeping the entrance of the Dardanelles on the *lee bow*, so as to enter *close* to Cape Hellas, thereby avoiding the *strength* of the current, and getting into *anchorage* ready for a change of wind. I don't think any trouble should be felt at anchoring in thirty or thirty-five fathoms, and I am persuaded that much time is lost, and unnecessary anxiety incurred by allowing ships to drift, and beat about when they might be safe at anchor, and in the way to take advantage of the first shift of wind.

The morning after we reached Cape Hellas the wind changed to the westward after having blown from contrary quarters for forty days, and the consequence was that we found ourselves sailing through the Dardanelles with an immense fleet of wind-bound vessels of all sizes, descriptions, and nations, not less in number than six hundred, and as the day was fine it was an interesting and beautiful sight.

5.—Ships steering from off Marmora Island for Constantinople in the night, are almost sure to find themselves to the southward of their course, probably among the Prince's Islands, on account of the current from the Bosphorus taking them on the *port bow*; this is to be avoided by steering for the land after clearing the Marmora channel, and coasting along at a distance of a league or a league and a half from the shore until they draw in closer as they approach the Golden Horn.

6.—The common opinion that the current never *sets up* the Bosphorus is erroneous, for while we were anchored between Constantinople and Scutari, the whole of the ships in the stream swung round to a current from the Sea of Marmora, which set up the Bosphorus at a rate of not less than *three knots*; a rare and interesting phenomenon, the cause of which I was unable to discover, and probably reaching down to no greater depth than three or four fathoms, while below that would be the perennial current running *down* the Bosphorus from the Black Sea.

There are few great Historical Places about which more has been said and sung than about Constantinople, and there is not on the earth perhaps a more magnificent site for an Imperial City; yet what is the impression it makes on the traveller, different from what he experiences in any other great Eastern city, unless it is that the dark contrast of splendour and squalor is in this city of the Sultan more darkly contrasted than in others. Is it not better that the *Crescent* should have ceased to be the true symbol of such an empire. "No longer a Crescent but a waning Moon," is written upon everything Turkish, and as it seems upon everything Eastern; and it is impossible not to be struck in the present day with the fact of how many *grand names* have become unreal, and amongst them especially and particularly "The Sublime Porte."

There is one sight to be seen in Constantinople not to be forgotten by the few who may chance to have had their eyes directed to the spot. This is in St. Sophia's, high up arching over what was once the Sanctuary, is to be still dimly seen, after all the many centuries and changes which have passed over the world—A FIGURE OF THE SAVIOUR with His arms outstretched in the act of blessing. This is very remarkable after the lapse of so many ages of Mahomedan possession, and may not be without some significancy.

W. C. P.

A VISION OF MAUNA LOA.

IN our two last numbers will be found some highly interesting particulars of the great volcano of the Sandwich Islands, the principal one indeed of our globe. A little chart and also a view in our last number will contribute, not only to illustrate its locality, but also to show the enormous scale on which its eruptions have from time to time been going forward. We have now preserved, for adding to our account, one of those dreamy narratives in which celebrated writers indulge at times, from the pen of an American gentleman of writing celebrity, named "Sam Clements," who used the sobriquet of "Mark Twain," with which we shall conclude our present account of that very celebrated volcano; gathered from the columns of the *Commercial Advertiser* of Owhyhee. It is dated:—

VOLCANO HOUSE, CRATER OF "KILAUEA," Sandwich Islands, April 1, 1866.—All day long I have sat apart and pondered over the mysterious occurrences of last night. * * * * There is no link lacking in the chain of incidents—my memory presents each in its proper order with perfect distinctness, but still—

However, never mind these reflections—I will drop them and proceed to make a simple statement of the facts.

Towards eleven o'clock, it was suggested that the character of the night was peculiarly suited to viewing the mightiest active volcano on the earth's surface in its most impressive sublimity. There was no light of moon or star in the inky heavens to mar the effect of the crater's gorgeous pyrotechnics.

In due time I stood, with my companion, on the wall of the vast cauldron which the natives, ages ago, named *Hale mau mau*—the abyss wherein they were wont to throw the remains of their chiefs, to the end that vulgar feet might never tread above them. We stood there, at dead of night, a mile above the level of the sea, and looked down a thousand feet upon a boiling, surging, roaring ocean of fire!—shaded our eyes from the blinding glare, and gazed far away over the crimson waves with a vague notion that a supernatural fleet, manned by demons and freighted with the damned, might presently sail up out of the remote distance; started when tremendous thunder-bursts shook the earth, and followed with fascinated eyes the grand jets of molten lava that sprang high up towards the zenith and exploded in a world of fiery spray that lit up the sombre heavens with an infernal splendour.

"What is your little bonfire of Vesuvius to this?"

My ejaculation roused my companion from his reverie, and we fell into a conversation appropriate to the occasion and the surroundings. We came at last to speak of the ancient custom of casting the bodies of dead chieftains into this fearful cauldron, and my comrade, who is of the blood royal, mentioned that the founder of his race, old King Kamehameha the First—that invincible old pagan Alexander—had found other sepulture than the burning depths of the *Hale mau mau*. I grew interested at once; I knew that the mystery of what became

of the corpse of the warrior King had never been fathomed ; I was aware that there was a legend connected with this matter, and I felt as if there could be no more fitting time to listen to it than the present. The descendant of Kamehameha said :

“ The dead king was brought in royal state down the long, winding road that descends from the rim of the crater to the scorched and chasm-riven plain that lies between the *Hale mau mau* and those beetling walls yonder in the distance. The guards were set and the troupes of mourners began the weird wail for the departed. In the middle of the night came a sound of innumerable voices in the air, and the rush of invisible wings ; the funeral torches wavered, burned blue, and went out ! The mourners and watchers fell to the ground paralyzed by fright, and many minutes elapsed before any one dared to move or speak, for they believed that the phantom messengers of the dread Goddess of Fire had been in their midst. When at last a torch was lighted, the bier was vacant—the dead monarch had been spirited away ! Consternation seized upon all, and they fled out of the crater. When day dawned, the multitude returned, and began the search for the corpse. But not a footprint, not a sign, was ever found. Day after day the search was continued, and every cave in the great walls, and every chasm in the plain, for miles around, was examined, but all to no purpose—and from that day to this the resting place of the lion king’s bones is an unsolved mystery. But years afterward, when the grim prophetess Wiahowakawaka lay on her deathbed, the goddess *Pele* appeared to her in a vision and told her that eventually the secret would be revealed, and in a remarkable manner, but not until the great *Kauhuhu*, the Shark God, should desert the sacred cavern *Ana Puhi*, in the Island of Molokai, and the waters of the sea should no more visit it, and its floor should become dry. Ever since that time, the simple, confiding natives have watched for the sign. And now, after many and many a summer has come and gone, and they who were in the flower of youth then have waxed old and died, the day is at hand ! The great Shark God has deserted the *Ana Puhi* : a month ago, for the first time within the records of the ancient legends, the waters of the sea ceased to flow into the cavern, and its stony pavement is become dry ! As you may easily believe, the news of this event spread like wildfire through the islands, and now the natives are looking every hour for the miracle, which is to unveil the mystery, and reveal the secret grave of the dead hero.”

After I had gone to bed, I got to thinking of the volcanic magnificence we had witnessed, and could not go to sleep. I hunted up a book and concluded to pass the time in reading. The first chapter I came upon related several instances of remarkable revelations made to men through the agency of dreams—of roads and houses, trees, fences and all manner of landmarks, shown in visions and recognized afterwards in waking, and which served to point the way to some dark mystery or other.

At length I fell asleep, and dreamed that I was abroad in the great

plain that skirts the *Hala mau mau*. I stood in a sort of twilight which softened the outlines of surrounding objects, but still left them tolerably distinct. A gaunt, muffled figure stepped out of the shadow of a rude column of lava, and moved away with a slow and measured step, beckoning me to follow. I did so. I marched down, down, down, hundreds of feet, upon a narrow trail which wound its tortuous course through piles and pyramids of seamed and blackened lava, and under over-hanging masses of sulphur formed by the artist-hand of Nature into an infinitude of fanciful shapes. The thought crossed my mind that possibly my phantom guide might lead me down among the bowels of the crater, and then disappear and leave me to grope my way through its mazes, and work out my deliverance as best I might, and so, with an eye to such a contingency, I picked up a stone, and "blazed" my course by breaking off a projecting corner, occasionally, from lava walls and festoons of sulphur. Finally we turned into a cleft in the crater's side, and pursued our way through its intricate windings for many a fathom down toward the home of the subterranean fires, our course lighted all the while by a ruddy glow which filtered up through innumerable cracks and crevices, and which afforded me occasional glimpses of the flood of molten fire boiling and hissing in the profound depths beneath us. The heat was intense, and the sulphurous atmosphere suffocating, but I toiled on in the footsteps of my stately guide, and uttered no complaint. At last we came to a sort of rugged chamber whose sombre and blistered walls spake with mute eloquence of some fiery tempest that had spent its fury here in a bygone age. The spectre pointed to a great boulder at the farther extremity—stood and pointed silent and motionless, for a few fleeting moments and then disappeared! "The grave of the last Kamehameha!" The words swept mournfully by, from unknown source, and died away in the distant corridors of my prison-house, and I was alone in the bowels of the earth, in the home of desolation, in the presence of death!

My frightened impulse was to fly, but a stronger impulse arrested me and impelled me to approach the massive boulder the spectre had pointed at. With hesitating step I went forward and stood beside it—nothing there; I grew bolder and walked around and about, peering shrewdly into the shadowy half light that surrounded it—still nothing. I paused to consider what to do next. While I stood irresolute, I chanced to brush the ponderous stone with my elbow, and lo! it vibrated to my touch! I would as soon have thought of starting a kiln of bricks with my feeble hand. My curiosity was excited. I bore against the boulder, and it still yielded—I gave a sudden push with my whole strength, and it toppled from its foundation with a crash that sent the echoes thundering down the avenue and passages of the dismal cavern! And there, in a shallow excavation over which it had rested, lay the crumbling skeleton of King Kamehameha the Great, thus sepulchered in long years, by supernatural hands! The bones could be none other, for with them lay the rare and priceless crown of *pulamalama* coral, sacred to royalty, and *tabu* to all else beside. A hollow human groan issued out of the—

I woke up. How glad I was to know it was all a dream! "This comes of listening to the legend of the noble lord—of reading of those lying dream revelations—of allowing myself to be carried away by the wild beauty of old *Kilauea* at midnight—of gorging too much pork and beans for supper!" And so I turned over, and fell asleep again. And dreamed the same dream precisely as before: followed the phantom—"blazed" my course—arrived at the grim chamber—heard the sad spirit voice—overturned the massy stone—beheld the regal crown and decaying bones of the great king!

I woke up, and reflected long upon the curious and singularly vivid dream, and finally muttered to myself, "This—this is becoming serious!"

I fell asleep again, and again I dreamed the same dream, without a single variation! I slept no more, but tossed restlessly in bed, and longed for daylight. And when it came I wandered forth, and descended to the wide plain in the crater. I said to myself, "I am not superstitious, but if there is anything in that dying woman's prophecy, I am the instrument appointed to uncurtain this ancient mystery." As I walked along, I even half expected to see my solemn guide step out from some nook in the lofty wall, and beckon me to come on. At last when I reached the place where I had first seen him in my dream, I recognized every surrounding object, and there, winding down among the blocks and fragments of lava, I saw the very trail I had traversed in my vision! I resolved to traverse it again, come what might. I wondered if, in my unreal journey, I had "blazed" my way, so that it would stand the test of stern reality; and thus wondering, a chill went to my heart when I came to the first stony projection I had broken off in my dream, and saw the fresh new fracture, and the dismembered fragment lying on the ground! My curiosity rose up, and banished all fear, and I hurried along as fast as the rugged road would allow me. I looked for my other "blazes," and found them; found the cleft in the wall; recognized all its turnings; walked in the light that ascended from the glowing furnaces visible far below; sweated in the close, hot, atmosphere, and breathed the sulphurous smoke—and at last I stood hundreds of feet beneath the peaks of *Kilauea* in the ruined chamber, and in the presence of the mysterious boulder!

"This is no dream," I said; this is a revelation from the realm of the supernatural; and it becomes not me to longer reason, conjecture, suspect, but blindly to obey the impulses given me by the unseen power that guides me."

I moved with slow and reverent step toward the stone and bore against it. It yielded perceptibly to the pressure. I brought my full weight and strength to bear, and surged against it. It yielded again, but I was so enfeebled by my toilsome journey that I could not overthrow it. I rested a little, and then raised an edge of the boulder by a strong, steady push, and placed a small stone under it to keep it from sinking back to its place. I rested again, and then repeated the process. Before long, I had added a third prop, and had got the edge

of the boulder considerably elevated. The labour and the close atmosphere together were so exhausting, however, that I was obliged to lie down, then, and recuperate my strength by a longer season of rest. And so, hour after hour I laboured, growing more and more weary, but still upheld by a fascination which I felt was infused into me by the invisible powers whose will I was working. At last I concentrated my strength in a final effort, and the stone rolled from its position.

I can never forget the overpowering sense of awe that sank down like a great darkness upon my spirit at that moment. After a solemn pause to prepare myself, with bowed form and uncovered head, I slowly turned my gaze till it rested upon the spot where the great stone had lain.

There wasn't any bones there.

* * * * *

I just said to myself, "Well, if this ain't the — infernalist swindle that ever I've come across yet, I wish I may never!"

And then I scratched out of there, and marched up here to the Volcano House, and got out my old raw-boned fool of a horse, "Oahu," and "lamed" him till he couldn't stand up without leaning against something.

You cannot bet anything on dreams.

MARK TWAIN.

We add in conclusion, the following interesting account of the crater of Kilauea by Count Strzelecki, who visited it in 1838, although it is but remotely connected with the shaft of the great crater of Mauna Loa, as it seems to convey an idea of the extraordinary magnitude of the whole volcano; Kilauea crater not overflowing, which is some thousand feet lower than that of Mauna Loa.

I cannot even attempt to give you the slightest idea of the impressions which the awful sublimity of the volcano produced upon my imagination; that part of our being does not yield as easily as memory—it does not reproduce sensations; the rapture—the enthusiasm once gone by, is lost for ever.

What I remember, and long shall recollect, as showing the mighty influence of mighty objects upon me, are the difficulties I had to struggle with, before my eye could be torn away from the idle, vacant but ecstatic gazing with which I regarded the great Whole, down to the analytical part of the wondrous and unparalleled scene before me; I say unparalleled, because having visited most of the European and American volcanoes, I find the greatest of them inferior to Kilauea crater, in intensity, grandeur, and extent of area.

The abrupt and precipitous cliff which forms the N.N.E. wall of the crater,—found, after my repeated observations, to be elevated 4,104 feet above the level of the sea—overhangs an area of 3,150,000 square yards of half-cooled scoria, sunk to the depth of 300 yards, and containing more than 328,000 square yards of convulsed torrents of earths in igneous fusion, and gaseous fluids constantly effervescing—boiling—spouting—rolling in all directions like waves of a disturbed sea,

violently beating the edge of the cauldrons like an infuriated surf, and like surf spreading all around its spray in the form of capillary glass which fills the air, and adheres in a flaky and pendulous form to the distorted and broken masses of the lava all around; five cauldrons, each of about 5,700 square yards, almost at the level of the great area, and containing only the twelfth part of the red liquid; the sixth cauldron is encircled by a wall of accumulated scoria of fifty yards high, forming the S.S.W. point—the *Hale mau mau* of the natives to which the bones of the former high chiefs were consigned—the sacrifices to the goddess Pele offered—the abyss of abysses, the cauldron of cauldrons—exhibiting the most frightful area of about 300,000 square yards, bubbling red hot lava—changing incessantly its level—sometimes rolling the long curled waves with broken masses of cooled crust to one side of the horrible laboratory—sometimes, as if they had made a mistake, turning them back with spouting fury, and a subterraneous, terrific noise of a sound more infernal than earthly; around the blocks of lava, scoria, slags of every description and combination, here elevated, by the endless number of superimposed layers, in perpendicular walls of one thousand feet high—there torn asunder, dispersed, cracked, or remoulded—everywhere, terror, convulsion—mighty engine of Nature—and nothingness of man!

Nowhere does the solution of the great problem of volcanic fires by Sir Humphrey Davy, receive a more palpable illustration than here; the access of the water to the ignited masses of these minerals of alkaline and earthly bases, by which that great philosopher explained the convulsions of volcanic fires, is displayed here in most portentous, most awful effects. It is only to those millions of vents all around the crater, through which the superabundance of steam escapes—to the millions of fissures through which the sulphurous and sulphuric acids liberate themselves from beneath, that the preservation of Hawaii from utter destruction, by the expansive force of steam and gases, can be ascribed.

The nature of the volcano, with its uncommonly intense heat, and so many wide and easy openings is, to eject nothing without alteration, and to sublime every variety of substance which the concomitants of the volcanic fires embrace. Thus: here are the rare volcanic fires in capillary forms, and many perfect vitrifications; the muriate of ammonia in efflorescence, often conchoidal, often in elongated hexahedrons—and in one single instance, even in that rare form of a cubic crystal; thus, the sulphuret of arsenic, both as realgar and orpiment, the sulphur itself in most beautiful incrustations, crystalized in cubic or truncated octahedrons; the petro aluminarcs of Ssolfia (Italy), or alkaline sulphate of alumine, imbedded sometimes in crevices of lava, sometimes in argilacious earth; thus, the singular and rare cavernous lava, known hitherto to exist only in Iceland—its large tumefactions in blisters and bubbles, form a crust of the finest gloss to an arch of four feet thick, forming caverns through which the superabundance of lava in the crater discharges itself, as through subterranean tunnels, in all directions of the island.

A prolific imagination can find here a vast field for fanciful speculation on the origin, duration, and probable or possible results of the continued operations of this frightful and gigantic volcano. Science will never tire in a study of Nature; but, alas! beyond what she sees, and what strict inductive forms allow her to conclude, she must stop, admire, bow and repeat,

“*Sapientia hujus mundi stultitia est.*”

GREENWICH HOSPITAL: *Its proper Use and Appropriation.*

[The following letter is so important that we lose no time in giving it notoriety; not only on the score of justice regarding the real purpose of Greenwich Hospital, but also on that of humanity towards our worn-out seamen, beyond all other objects proposed for its application.]

SIR,—You were so good in your June number as to give place to a very able article on the present state of Greenwich Hospital. With many others, I read it carefully, and with many admired the taste and *esprit de corps* of the writer in desiring to keep Greenwich Hospital from being entirely alienated from the Navy. Since that article appeared, facts have come to light which make me shrink from entirely falling in with the views of the writer in disposing of the building. He advocated, with much consistency and strength of argument, that, it should be appropriated as a barrack for Marines. With this proposition I quite accord, except on one alternative, that of its being possible to reinstate the building as a home for the aged and infirm sailor and marine. I hold it quite possible to do this. The facts to which I allude, are, the wretched, poverty-stricken condition of hundreds of the pensioners who left the comforts of the Hospital behind them in October, 1865. What was foreseen before by those who are acquainted with a sailor's habits, is now clear. *They are not capable of managing their own affairs in their old age.* Whether it is that from having been so much at sea they have never acquired the habits essential to the prudent management of a small pension, or whether it is that in money matters they are ignorant as well as reckless, it comes to the same thing; they are not capable of managing a pension in their old age—under these circumstances, to give them pensions to be squandered in distant parts of the country, out of funds which were contributed for the purpose of maintaining the aged sailor *inside* Greenwich Hospital, is a proceeding which ought to be discontinued. The principle itself of giving pensions to seamen and marines after servitude is well enough—it is unavoidable—but members of the House of Commons should be reminded that such pensions cannot equitably be taken out of the funds of Greenwich Hospital. They should come out of the public purse, not out of the private, or rather naval property of Greenwich Hospital. This is a point which has been too

much ignored. It is a point which naval pens should have been more careful to keep before the mind of the country and the Admiralty. The funds of Greenwich Hospital can only, equitably be spent *inside the walls of the building*, of course for the good of the sailor and marine in their old age. I hope that the country will yet wake to the moral duty of conscientiously restoring these funds. Certainly the country must not be allowed to lie under the delusion that the pensions now enjoyed by sailors and marines come from the public purse. In giving these pensions, the country gives nothing. Greenwich Hospital gives them—gives them most unwillingly, while the building itself languishes for want of its legitimate inmates, and of the funds wherewith to maintain them in their ancient comfort.

To the Editor of the Nautical Magazine.

JUSTITIA.

[We trust that, on the grounds of their incapacity to take care of themselves when they most need it, the just claims of these veterans of the sea, even to be nursed in their declining age, will not be forgotten.—ED. *N.M.*]

THE THERMOMETER.

Table for reducing the Fahrenheit Scale into Centigrade and Réaumur,

BY ROBERT C. CARRINGTON, F.R.G.S.,

Hydrographical Draughtsman of the Admiralty.

THE Thermometer (θέρμος, heat, μέτρον, a measure) was in use in the beginning of the seventeenth century, but it is not precisely known by whom it was invented. A physician of Padua named Santorio claims it for himself in his "Commentaries on Avicenna" (1626). Spirit was originally used, but mercury was first employed by Fahrenheit, of Amsterdam, in 1720, and his scale has been in use since 1724. He adopted this, as he supposed, erroneously, that 32° below the freezing point of water was the Zero, or greatest degree of cold.

Réaumur, a Frenchman (1683—1751), invented his thermometer in 1731; but the Centigrade (*Centum*, hundred, and *Gradus*, degree) has now superseded it to a great extent, and has been in use amongst philosophers for nearly seventy years. It is the invention of Celsius, a Swede, and only differs from Réaumur's by dividing the distance between the freezing and boiling points into one hundred parts, instead of eighty as in Réaumur's.

There are disadvantages in the scales of Réaumur and Centigrade, as the length of each degree is much greater than in Fahrenheit, and not so easily nor accurately read when the mercury is between the lines of division; and the temperatures requiring to be registered being often below the freezing of water, are always obliged to be expressed by negative signs.

The different scales are easily convertible by the following rules:—

Centigrade to Fahrenheit, multiply by 9, and divide by 5.

$$\frac{9}{5} \text{ C.} + 32^{\circ} = \text{F.}, \text{ or } 100^{\circ} \times \frac{\text{Cent.}}{9} = 900 \div 5 = 180 + 32 = 212^{\circ} \text{ Faht.}$$

Réaumur to Fahrenheit, multiply by 9, and divide by 4.

$$\frac{9}{4} \text{ R.} + 32^{\circ} = \text{F.}, \text{ or } 80^{\circ} \times \frac{\text{Reaum.}}{4} = 720 \div 4 = 180 + 32 = 212^{\circ} \text{ Faht.}$$

Fahrenheit to Centigrade, multiply by 5, and divide by 9.

$$(\text{F.} - 32^{\circ}) \frac{5}{9} = \text{C.}, \text{ or } 212^{\circ} - 32 = 180 \times \frac{\text{Faht.}}{9} = 900 \div 9 = 100^{\circ} \text{ Cent.}$$

Fahrenheit to Réaumur, multiply by 4, and divide by 9.

$$(\text{F.} - 32^{\circ}) \frac{4}{9} = \text{R.}, \text{ or } 212^{\circ} - 32 = 180 \times \frac{\text{Faht.}}{9} = 720 \div 9 = 80^{\circ} \text{ Réaum.}$$

Centigrade to Réaumur, multiply by 4, and divide by 5.

$$\frac{4}{5} \text{ C.} = \text{R.}, \text{ or } 100^{\circ} \times \frac{\text{Cent.}}{5} = 400 \div 5 = 80^{\circ} \text{ Réaum.}$$

Réaumur to Centigrade, multiply by 5, and divide by 4.

$$\frac{5}{4} \text{ R.} = \text{C.}, \text{ or } 80^{\circ} \times \frac{\text{Reaum.}}{4} = 400 \div 4 = 100^{\circ} \text{ Cent.}$$

Fahrenheit.	Centigrade.	Réaumur.	Fahrenheit.	Centigrade.	Réaumur.
212°	100°	80°	100°	37°·78	30°·22
205	96·11	76·89	95	35	28
200	93·33	74·67	90	32·22	25·78
195	90·56	72·44	85	29·44	23·56
190	87·78	70·22	80	26·67	21·33
185	85	68	75	23·89	19·11
180	82·22	65·78	70	21·11	16·89
175	79·44	63·56	65	18·33	14·67
170	76·67	61·33	60	15·56	12·44
165	73·89	59·11	55	12·78	10·22
160	71·11	56·89	50	10	8
155	68·33	54·67	45	7·22	5·78
150	65·56	52·44	40	4·44	3·56
145	62·78	50·22	35	1·67	1·33
140	60	48	32	0	0
135	57·22	45·78	30	—1·11	—0·89
130	54·44	43·56	25	—3·89	—3·11
125	51·67	41·33	20	—6·67	—5·33
120	48·89	39·11	15	—9·44	—7·56
115	46·11	36·89	10	—12·22	—9·78
110	43·33	34·67	5	—15	—12
105	40·56	32·44	0	—17·78	—14·22

THE FIRST TRIP UP THE PARA RIVER BY ONE OF H.M. SHIPS.

[A SKETCH of the first trip made up the Para River by an English ship of war must be interesting in itself. The following extract of a letter containing the account of a visit to the town of Cameta on that river, by H.M.S. *Sharpshooter* in August last, is by an officer who will no doubt make good some of the deficiencies in the charts of which he complains. But his brief directions for that navigation seem to be sufficient to secure safety, and will no doubt be found useful to the trade, which will quickly follow up the river as far as he went.—ED. N.M.]

Para, August 7th.

As I know you would like to have an account of the cruise of the first English ship above Para, I send you the following brief notes. On arriving here (20th July) I visited the Admiral (who is also the President of the Province), and asked him whether English ships of war would be allowed to pass up the Amazon after the 7th September. His reply was that on application from the Captain of the ship to him, not only would the request be granted, but every assistance allowed her. He also gave me leave to go to Cameta, a large town about thirty miles up the Tocantins River, one of the large confluent of the Amazon, and about sixteen hundred miles long, and one hundred from the anchorage. So accordingly we started on the 29th July on our voyage in charge of a pilot, lent by the Amazon Commanding Officer, and gained the South entrance to the Amazon, entering by the channel between the islands Ariparanga and Contejouba. By keeping close to the latter, we carried four fathoms, where our chart gives only one and a half; but the banks are constantly altering. The river here is thirty miles broad, and very deep up to the entrance of the River Tocantins, where we anchored for the night in a snug place inside some islands. We all landed to shoot, but found no game, nor even alligators; only one large water snake that the gig's crew attacked and killed with their knives.

On my return to the ship at about eight p.m., I was surprised to hear that one of our engineer officers with a ship's boy had landed in a canoe and were not yet returned. It was satisfactory to know that the people were very friendly, yet I immediately sent a boat with the second master in charge to search, and although they did search the beach for five miles, and the creek near us, they returned at midnight unsuccessful. The next morning I sent a boat in two directions for five miles, and went up the creeks myself with the doctor, but although we found villages and houses nearly every quarter of a mile, and the Indians very anxious to assist us, and also the head men (Brazilians) inducing the natives to search, yet we could gain no news of our lost pair. So at eleven a.m., I returned to the ship, and leaving the cutter with three days' provisions and the authority to make the offer of fifty mil reis to the natives as a reward for finding them, I steamed up the river searching the banks as we went. It was flood tide when they were last seen.

On arriving at Cameta, the police authorities immediately sent canoes to search, and orders to all the villages to do the same, and happily on the morning of August 1st, the boy was found naked on an island ten miles from where he had been capsized with the canoe. He was fed, clothed, and sent to the ship. His account was that they tried to land on the main shore, but not succeeding, attempted to reach an island at some distance from the shore, but the breeze freshening, the canoe was capsized.

Believing that they were drifting out into the Amazon, they stripped for a swim, shook hands, and struck out for an island, having agreed to hail each other occasionally, when at last the boy says he got no answer.

We immediately sent another cutter and the gig to search near where the boy was found, and I went myself in a small steamer, which we had repaired, but was again unsuccessful. However, on our return, I had the satisfaction to learn that my man had been picked up by a canoe belonging to a village forty miles away, so there I despatched a boat for him.

It is really almost difficult to speak too highly of the promptitude and energy shewn by the Delgado and all the authorities at Cameta in trying to recover this officer. The behaviour of the boats with the natives was admirable, and there appeared a determination to find the wanderers at all risks, if they proved above water. The search was continued constantly for five days.

The navigation of the Tocantins is difficult on account of the number of islands in it, and the absence of charts. A good mode of proceeding is to enter the river between the second and third islands on the eastern bank, then keep along that shore for eighteen miles in not less than six fathoms, then steer S.W. across the river to Cameta, where there is a good anchorage off the town in eight fathoms water at about a cable from it. The tide rises nine feet, and runs two and a half knots. The town is situated on the highest ground near, about twenty feet above water, on a rich, red clayish soil. At this time of year, though very hot, it was considered very dry and healthy. The chief cultivation is the Cacao, which grows nearly wild, and the rubber tree or catchouc quite wild. The population of the town is 3000, the greater number Indian—though many Brazilians and Portuguese. The district has 25,000 free and 5000 slaves. The police control is the most perfect I have seen. Every resident is compelled to send his children to school, under a heavy fine. At every small village there is a church with school attached, and a government schoolmaster. The Indians also appear perfectly civilized and very hospitable. Their features remind me very much of the Chinese. The country is low and thickly wooded like all tropical places, and cut up by a perfect network of creeks and rivers. This unfortunate accident has been the cause of our learning more of the country in one week than we otherwise should in six. The exports are chiefly Cacao and rubber, £22,400; imports £6,200.

In a few years there seems no reason why this should not be a

rising place, as the passage from the Tijoca Channel at the entrance is direct, and there is abundant facility everywhere for building wharves for large vessels. At present, however, the large government subsidy to the Amazon Company must keep down all opposition. On the 2nd of August, all of the authorities and families visited the ship and were treated with some practice from our heavy guns, and in the evening the scene was changed to a ball room, with convivial toasts, etc. On the 3rd, a return ball was given to us, which was kept up with great spirit, and at daylight we steamed away to Para. Here we were visited by the President, for whom we manned yards and received him with due salutation. He has been in England, and looks more like an Englishman than Brazilian. On the 8th, our cutter came back in the middle watch after a pull of sixty miles through the inland passages, and reports very favourably of the natives, but without the officer they were in search of, as he was forwarded on here in a schooner, so I hope to see him in a day or two. We shall then go to Maranham, Ceara, Parahyba, Bahia, and Rio. The tides here are very regular at this time of year, rise and fall about nine feet, and strength two and a half knots.

The surveying authorities tell me that the main channel of the Amazon, north of Cape Magoari, is only used by coasters, as it is so imperfectly known, not yet surveyed, and the western entrance is too dangerous on account of the Bore.

They have placed two buoys at the entrance of the Tijoca Channel and will have a Light vessel placed in a few months. We found little difficulty in entering without a pilot, except on account of the strong current which sweeps across the Braganza Bank, at three a.m.

ROYAL NATIONAL LIFEBOAT INSTITUTION.

A meeting of this Institution was held on Thursday, September 5th, at its house, John-street, Adelphi, THOMAS CHAPMAN, Esq., F.R.S., V.P., in the chair. There were also present Sir Edward Perrott, Bart., W. H. Harton, Esq., the Right Hon. Stephen Cave, M.P., George Lyall, Esq., Colonel Palmer, and John Griffith, Esq. The minutes of the previous meeting having been read, a reward of £6 8s. was voted to pay the expenses of the Institution's lifeboat, *Civil Service*, stationed at Wexford, Ireland, in putting off on the 17th August in reply to signals of distress, while it was blowing hard from the W.S.W., and saving, after much difficulty, the crew of four men of the smack, Robert Hudson, of Arklow, which, while making for Wexford with a cargo of fish, had stranded on the south end of the Dogger Bank. This lifeboat has already saved forty lives from different shipwrecks.

The silver medal of the Institution and a copy of its vote on parchment were ordered to be presented to the Hon. Auberon Herbert,

for putting off in the Cromer lifeboat of the Institution, when it was short-handed, on the 26th July last, with the view of rescuing the crew of a vessel which was wrecked near that place in a gale of wind and very heavy sea. The shipwrecked men had, however, been rescued by means of the rocket apparatus before the arrival of the lifeboat.

The second service Clasp of the Institution was also voted to Mr. William Cubitt, of Bacton Abbey, Norfolk, the local hon. secretary of the National Lifeboat Institution, for his gallantry on a recent occasion in saving life on the Norfolk coast. A reward of £6 was also granted to five pilots, who had put off in a shore-boat, and had saved two out of eight persons whose boat had capsized on the Herd Sand, at the mouth of the Tyne, in a heavy sea, on the 28th of July last. A reward of £12 was also given to twelve men for putting off, and assisting to save the lives of some of the passengers and crew of the steamer, *Rose of Glasgow*, which during a strong gale had become a total wreck in Brown's Bay, Ireland, on the 16th July. A reward of £2 10s. was likewise granted to four men for going out in a small boat in a strong wind and heavy sea on the 6th August, and saving the lives of two out of five persons whose boat had capsized on Aberystwith Bar. Various other rewards were also granted to the crews of shore-boats for putting off during recent gales, and assisting to save life from wrecks on our coasts. A vote of condolence was ordered to be presented to his Grace the President, on the occasion of the death of his venerable father, the late Duke of Northumberland.

It was reported that the Institution had recently sent new lifeboats to Stromness (Orkneys), Broughty Ferry (Dundee), and Hunstanton (Norfolk). The railway and steam packet companies had as usual kindly conveyed the boats free of charge to their destinations. A grand demonstration had taken place on September 4th, at Hunstanton, with that boat, which is the gift to the Institution of the Licensed Victuallers of England. A most imposing demonstration had also taken place at Falmouth on the 29th August, at the inauguration of the *City of Gloucester* lifeboat on that station. It was decided to form a new lifeboat station at Portrane, on the Irish coast. Mrs. Burgess, of St. John's-wood, had decided to defray the cost, amounting to £420, of the lifeboat and carriage about to be sent by the Institution to Stonehaven, N.B., in memory of her late husband. During the past month a legacy of £540 had been received from the executors of the late Miss Ellen Goodman, of Eversholt, to pay for a lifeboat, carriage, and gear. Also, an additional moiety of £31 12s. from the pure personal estate of the late Miss Martha Bebb, of Bootham, York. Payments amounting to upwards of £2,000 were ordered to be made on various lifeboat establishments. A communication was read from the Chevalier Hebel, the Prussian Consul General, expressing the thanks of his Government for the information that had been afforded him relative to the working of the lifeboat system on the shores of the British Isles. Reports were read from the inspector and assistant-inspector of lifeboats to the Society on their recent visits to some of its lifeboat stations on the coast. The proceedings then terminated.

NEW BOOKS.

THE SAILOR'S WORD-BOOK. *An Alphabetical Digest of Nautical Terms, etc.* By the late Admiral W. H. Smyth, K.S.F., etc. Blackie, London.

THE literary labours of the late Admiral William Henry Smyth seem to have occupied those numerous small intervals of time left from the more important pursuits of a professional kind, as well as those of a purely astronomical nature, to which his natural taste led him. Professional usefulness in his day was evidently his leading star, and we have here in his "*Sailor's Word-Book*," one of those results of his persevering endeavours in a branch of nautical literature which has been too much neglected. What other literary pursuit is there of nearly universal application that has not received attention?—but the Sailor's vocabulary is left in its primitive condition, and he is allowed to run riot without that literary guidance, extended to other branches of knowledge; but which he so much requires to rule his expressions and to serve as a text-book for his orthography.

No one understood this better than the author of the "*Word-Book*,"—how completely "*Jack*" was adrift for the authority for his lingo—how much it required looking after and being kept in order—no one we say knew this better than the Admiral, and he found time to assist in rectifying the matter.

Assuredly a "*Word-Book*" for seamen was no light undertaking. When it is considered that their nautical expressions, or shall we say the accepted names by which the numerous component parts of their dwelling place is known, expressions of diverse origin as the English language itself, that the names of all these, and also of that (to an inexperienced eye) interminable maze of rigging belonging to it, all owing their origin to different languages;—to produce a book that shall be the accepted text-book of their etymology and orthography. Such a task, we say, was one of no ordinary kind, requiring not only the research of the scholar, but the attainments of as many learned heads as he could bring to his assistance. And how much such a book was wanted may be inferred from the fact that the present work left us by Admiral Smyth stands alone.

There is a very common expression among sailors, appearing perpetually in their journals which are yet disfigured by its use in the simple word "*way*"—too commonly written "*weigh*." The anchor is *weighed*: but its weight is never needed, except possibly in the warrant-officer's store book, who happens to have charge of it. Again, when the ship is "*got under weigh*" there is the same term sometimes written "*way*;" but from the absence of all authority for reference, the former mode of expression, absurd as it is, beats the other and becomes the accepted one, although neither the ship nor the anchor has undergone the operation of being "*weighed*!" whenever this occurs.

The English language has been justly admired for its terseness and

beauty of expression; and it would be no stretch of eulogy to say, that the seaman's language although perhaps but a rough copy of it, is no less remarkable for terseness, good application as well as derivation. A language that has to deal with the sails and rigging of a ship must necessarily be brief, at once intelligible, and distinct;—for operations with those important adjuncts of a ship should, if possible, be as smart and sudden as the squall of wind itself. Time in fact should be reduced to its very minimum in the shortening, if not in the making of sail, because the safety of that sail, the mast, ay, and of the ship herself, may depend on that sail being instantly taken in. Every seaman knows this full well, and how often it happens that when such is not done the ship is dismasted, or thrown on her beam ends to get up again if she can. The old adage that "Time and tide for none abide," belongs to sailors, and only they know the full value of it. Hence the terseness of their expressions which we have somewhere heard was the admiration of the first Emperor of the French, who is represented to have been peculiarly struck by it and its facility of command in comparison with the wordy orders required by the French marine.

We remember fitting out nearly half a century ago, when the spritsail-yard was condemned and "whiskers" adopted in its stead. Some few years afterwards we were applied to by a learned French lexicographer, to tell him what was meant by a ship's "*whiskers*"! He knew our language; he knew every word in our maritime dictionaries, but not one of them could afford the information he wanted. He had come to the right person certainly, for ours was about the first ship supplied from the dockyard with these unfeminine appendages to Jack's favourite lass, and we had the gratification of at once unravelling the mystery to our friend. "Brevity" is said to be "the soul of wit," and it might also be called the "mastery of learning," it is a kind of *multum in parvo*, which somehow or other Jack falls into, and at once presses it into his service. And this brings us back to the point before us about that wretched word "*weigh*," which in our opinion should be spelt w-a-y; the reason for which, no doubt, has occurred to others as well as ourselves, and which is this:—

When a ship leaves an anchorage, no matter where, it will be allowed that she gets under *sail on her way* to sea or anywhere else. But the redundancy of expression, or the supernumerary words italicized, may easily be considered as too many to be recorded in the log, and "gets under way" would be sufficient. But *weighing* the anchor might be urged against it, although it is not weighed at all, but simply recovered by the ship, and yet recovering the anchor, or even regaining it might sound pedantic in nautical ears, fact as it may be, and yet we say the anchor's "away," which it really is when it is off the ground. We have even seen the expression, the anchor was "wayed," in old Hakluyt, but to our taste the word "tripped" would have been better perhaps, although meaning only, as Admiral Smyth agrees, the loosening it from its bed. So that after all, as our sea-logs

are expected to be precise in their details, we should be satisfied with saying in ours, "hove up" the anchor, as an operation mainly essential in preference to "weigh" it, when making sail or getting under way.

We have been led further than we expected in our disquisition, and must content ourselves at present with this opening of an interesting subject, as a prelude to further discussion. In some future numbers we shall return to the work before us, but we take this opportunity of recommending it to the attention of the nautical world. It is the production of a mariner who was also distinguished as an astronomer and a man of science, and necessarily combines other terms applying to the sea that, although not of every-day application, are yet required by the accomplished seaman.

NOTES ON NOVELTIES.

AMONG the various novelties turned up since our last, those of importance seem to be the Expedition to Abyssinia and the readiest route from Rangoon to Cochin China. That exclusive country of *Rasselas*, hedged round by mountain difficulties and the chances of a tropical clime, is ruled by an autocrat who defies our arms and holds our subjects in contempt of us, is we trust to have a lesson by which he will find that he is not so invulnerable as he imagines. Difficulties there are to be overcome of no ordinary kind, but we have no doubt they will be overcome by good management and determination. On the subject of how to do it we find the following in a little "*Hand-book of Abyssinia*," compiled by Mr. George Peacock, published by Longman.

He says:—

"It would seem, therefore, that instead of invading Abyssinia of necessity by the Taranta and Adowa passes from Arkeeko (Massowah) within the straits of Babel-Mandeb,* there are three routes open in the south, nearer the base of operations, where supplies are plentiful, after two or three days' march over a sandy plain, and an open country before us, leading to Gondar, *vid* Ankober, the southern capital of the empire, which city is situated in the kingdom of the united provinces of Shoa, Efat, and Hurrer, in lat. 9° 20' N., and about 39° 50' E., some ninety leagues from Zeila and Tajura, and about one hundred leagues from Berbera. Mr. Salt states this to be the finest district of Abyssinia. But we must look at the political difficulties as well as the physical which present themselves in this almost *terra incognita*, namely, the want of knowing at present with any degree of accuracy, in what position Theodorus is in as to the rebellious portion of his subjects. It may be that the fierce Galla tribes are leagued on his side, together with the chiefs of Shoa, Efat,

* The gate of ...ing, or of death

and Hurrer, against some or *all* of the other chiefs, or petty kings of the northern and eastern provinces of Tigrè, Enderta, Samen, and Agame.

"The provinces of Amhara and Lasta may or may not be with the Emperor. Salt tells us that when he was in Abyssinia, Guxo, the Gallo chief, could bring 20,000 cavalry into the field, raised chiefly from the district of Begemder in the province of Amhara, and that his power was absolute on the west side of the Takazzee river. It seems highly probable that Theodorus is the present representative or descendant of this terrible Galla chief who held the legitimate Emperor as a prisoner in Gondar at the time Salt speaks of, and was the sworn enemy of Ras Walud Selasse, the chief of Tigrè and Enderta.

"No doubt intestine warfare has been carried on more or less ever since this period (some sixty years ago); and, therefore, it would be very desirable, if possible, to cultivate the alliance of those chiefs who command the passes from Arkeeko (Massowah) through the Taranta and Shirè ranges, by appropriate presents; but should these passes be in possession of Theodorus or his allies, then the southern route might be preferable. No doubt the government have already sent despatches to Aden to ascertain all these particulars, pending the arrival of the troops from Suez and Bombay.

"The distance from Ankober to Gondar is about seventy-five leagues, through a fine country. The distance from Bombay to Aden is about five hundred and fifty-five leagues, or six days' steaming in favourable weather. The distance from Suez to Aden is about four hundred and forty-four leagues, or five days' steaming in favourable weather.

"The *Liberté* gives a description of the Emperor Theodore, his kingdom, and his army, far less discouraging for the British expedition (which, by the way, it thinks most just and necessary) than that of Count du Bisson. The Abyssinians, or the Amhara as they call themselves (for the Abyssinian word Habechi is Arab), are very well preserved specimens of the pure Abyssinian race. They have nothing of the negro about them, but, at the same time, very little of the white. Branches of the race extend to Nubia in the north, and to the south as far as the Indian Ocean, including the Somalis country. The Nubian domestics, called in Egypt *barabrah*, are closely allied with the Abyssinians. The nomade and warlike tribes which are established or wander about between the Nubian Nile and the first ranges of the Abyssinian and Red Sea mountains (Bichari and Chaghie) are themselves Abyssinians, slightly crossed with the Arab race. The Galla, or Mussulmen, in the plains south of Abyssinia, are pure Abyssinians, converted to Islamism. The Emperor Theodore, or Tedros, as pronounced by his enemies, the Bichari, though in his youth enamoured of the theory of grand agglomerations, has only endeavoured to unite under his sceptre the Amhara Christians of the European rite. The English will only have to fight the Christians on the high plateaux, and will find useful auxiliaries in numerous Mahometan tribes, all enemies of the Amhara of the mountains.

Even the latter are not very warm partisans of Tedros, who, though he has fabricated a genealogy making himself descended from David and Solomon, is a man of low origin. He never had a regular army, only chance adventurers, attracted by the hope of a razzia."

It is also stated by the *Standard* that, "The commander selected is a thoroughbred soldier, not likely to let the grass grow under his feet, to fight in velvet gloves, to neglect the wants of his men, or give advantages to the enemy. It may be true that neither Sir Robert Napier nor his troops will bring home much of glory or booty from Abyssinia; but were we to submit to the sacrifice of our countrymen without striking a blow, after all appeals were ended on their behalf, we should pay a far dearer price among those deserts in the surrender of our national reputation; and then, indeed, it might again be said, light lies the earth on the ashes of English pride! The Abyssinian expedition, should the last chance of a pacific result disappear, as it almost inevitably will, will be a national necessity."

We shall look with anxiety for accounts of the progress of our gallant men and their impression on the tyrant Theodore.

The following appears in a recent number of the *Hants. Telegraph* :—

"Naval doings on the Jamaica station are likely again to give occasion for an inquiry on the part of Her Majesty's Attorney-General. From the files brought by the Royal Mail Company's steamer *La Plata*, we perceive that the local papers comment on an unseemly altercation which has taken place between the coroner of Port Royal and the captain of H.M.S. *Constance*. It seems that a seaman belonging to that ship had fallen from the rigging and broken his neck, and the coroner hearing of the accident proceeded in a boat to the *Constance*, which was lying in the harbour. If the official went for the purpose of holding an inquiry "on view of the body" he was disappointed in his object, for Captain Barnard, on being informed of the matter, refused to allow any inquest to be held on board, and ordered the coroner and jury over the ship's side. Sir Leopold M'Clintock, the commodore on the station, was next appealed to, but in vain, for he dismissed the offended coroner, telling him that he must not again interfere with any of Her Majesty's ships. The body of the unfortunate seaman was then interred without further trouble, the coroner adjourning the inquest until the opinion of Her Majesty's Attorney-General was obtained as to his jurisdiction upon vessels of war in the harbour of Port Royal. These altercations are much to be regretted between the civil and military authorities."

No doubt such different views of duty must always be regretted. One party must be acting from ignorance of the law, which *ignorance* was one of the causes (we need not say what another was), of the wretched illegal doings of the navy in the recent shootings and hangings of negroes in the same island. When will our naval officers understand that they are not only to fight their country's battles in war, but to support the civil authorities in their legal proceedings at all times. One would suppose that inquests at our home ports on

British seamen, and on board H.M. ships in commission, were unknown. If they be legal at home, surely they cannot be illegal in our colonies!

The China tea-ship race has been won by the Taeping, the winner of last year's great race from China. She arrived off the Isle of Wight on the night of the 20th of September, having left China four days after the sailing of the Maitland. It appears her passage was performed in one hundred and four days.

It appears to be a question at present which is the best overland route to China from India, one from Rangoon having been proposed by Captain Sprye. A correspondent in whose experience we have much confidence, writes to us, "would it not be well to try a route which is likely to be found *easier* by going direct up the Irawaddy to Bamoo, five hundred miles above Mandalay and less than two hundred from the Chinese frontier. In 1863 (Maddo) I went to Mandala to see the king of Burmah, about English steamers going up the river, and found no trouble in getting his permission; the truth being that he would be glad to allow anything that promised an increase to his revenue. I may mention that I am acquainted with the navigation of the Ganges, Burhampooter, and the Irawaddy, and that of these three great rivers I consider that of the Irawaddy to be the least difficult." Here are formidable reasons which should be considered when weighing the pretensions of different *overland* routes to China.

It appears by the Cape papers that H.M.S. Galatea arrived at the Cape (Simon's Bay), on the 15th of August, when a series of ovations commenced in honour of her Captain H.R.H. the Duke of Edinburgh. His Royal Highness won the affections of the colonists a few years ago, when he was there as a midshipman, and his present appearance confirms all former impressions which find abundance of expressions in triumphal arches, loyal addresses, fetes, etc. It is considered that the visit of H.R. Highness is most apropos as an interesting event in the midst of the bitterness of dissension, and depressed monotonous condition of that South African colony.

Our gunboats on the China coast are as busy as ever in rooting out of their holes the piratical hoard which infest that coast.

Her Majesty's gun boat *Janus* left Hong Kong on the evening of the 17th August, having on board a mandarin and the Chinese who had given information respecting pirates. The *Janus* anchored that night, and next morning arrived at Deep Bay, where she fell in with a fishing junk, whose master furnished some valuable information. According to him, a pirate junk had been there the day before, having on board a heavy armament and eighty men. This man was retained on board as pilot, and the commander of the *Janus* endeavoured to take the gun boat up to Shami, the place to which he had been instructed to proceed. While searching for a passage the masts of a

junk were seen over the land, she having been run on shore and deserted by her crew. Efforts were made to get the *Janus* within gunshot, and she managed to get within half a mile of the junk, when the shoal water stopped her. Lieutenant Lloyd now called away his boats, and pulled for the junk, taking care that his approach was covered by the gunboat. A sharp fire of musketry and jingalls was opened on the advancing boats from parties stationed on the shore and the surrounding hills, and Lieutenant Lloyd made for the cover afforded by the junk. As soon as he boarded her with his men the natives on the beach were quickly dispersed by the fire kept up from their rifles, and this effected, the boats took the junk in tow, and although a heavy fire was kept up on them by the Chinese, who had returned to their position, no casualty occurred, and the junk was safely got out of gunshot. A few hours after the capture of the junk Lieutenant Lloyd landed a party to search for the guns of the junk, which search proved unsuccessful. While it was going on a large party of pirates in small junks made a dash to recover the captured junk, but their attempt was defeated by a party of small arm men advancing into the water covered by the marines on the beach. Two of these small junks were captured and subsequently burnt. The next day the *Janus* proceeded up to Shami, but unfortunately took the ground for nearly twenty-four hours, while searching for a passage. The charts of this neighbourhood are very defective, and it is not to be wondered at that Her Majesty's vessels occasionally use their keels as sounding leads. The *Janus* managed to get to within two miles of Shami, and the mandarin on board having communicated with the authorities Lieutenant Lloyd destroyed, with their consent, two houses known as piratical haunts.

That excellent institution of the school ship *Conway*, at Liverpool, has always had our best wishes, and we now preserve with pleasure an account of the late visit of the Right Hon. H. T. L. Corry, as first Lord of the Admiralty, on his presentation of the annual prizes in September last.

The CHAIRMAN congratulated the friends of the *Conway* upon the presence of the Lords of the Admiralty, and upon the proof which it afforded of the confirmed interest taken by Her Majesty's government in an institution, the merits of which they had hitherto so fully recognized, and he thought they might safely argue that the presence of Mr. Corry and his colleague was a proof that the government were satisfied that this institution was doing an essential national work.

The Right Hon. H. T. L. CORRY, before awarding the prizes, said—Ladies and gentlemen, I learn from the last report of the committee of management, of which I hold a copy in my hand, that the *Conway* is designed mainly to train, and complete the education of, boys intended for officers in the merchant navy, and it is impossible for any one in the office which I have the honour to fill not to take the deepest interest in an institution having such an object in view. In time of peace, under the continuous service system, with a large annual entry

of boys into the navy, the navy may be almost said to be self-sustaining ; but on the occurrence of any emergency requiring any material increase to its existing force, it is to the mercantile marine that it must look for the necessary supply of seamen—and as the quality of these must in no small degree depend upon the officers who command them, any institution having for its object the instruction of officers for the merchant marine must at all times command the entire sympathy of those who have any responsibility for the maintenance of our naval power.

But, independently of this consideration, there is another, which increases the interest which the navy and those connected with it must take in this ship. We have now a royal naval reserve, the officers in which hold commissions similar to those held by the officers in Her Majesty's fleet, and in the event of war would be called upon to share in the duties and responsibilities of those officers. No doubt many of the boys whom I have now the pleasure of addressing will belong to this reserve, and it is therefore of the greatest importance in the navy that they should receive an education such as I am happy to say they do receive on board this ship—and which will qualify them in every respect both as officers and gentlemen to discharge the responsible duties which they may be called upon to fulfil in Her Majesty's naval service.

But there is even a yet more intimate bond of union between the *Conway* and the navy than those to which I have referred. I understand that this institution was mainly established by the Mercantile Marine Service Association, consisting of about nine hundred merchant captains sailing from the port of Liverpool. But these gentlemen, not content with educating boys for that branch of the naval service in which they are themselves more immediately interested, also provide for the education on board this ship of cadets intended for Her Majesty's navy. This is therefore an additional reason why we should take an interest in this ship. And I cannot advert to the preparation which is given in this ship for appointments in the Royal Navy, without saying that I am certain that all the cadets whom I now have the pleasure of addressing must appreciate, as it deserves the generous manner in which her Majesty has come forward to encourage them to compete for appointments in the navy. I believe it has generally been the case that the First Lord of the Admiralty has placed at the disposal of the committee a naval cadetship of the first class, but I understand that in consequence of the successful competitor upon this occasion having reached an age which disqualified him for an appointment as a first-class cadet, it was the intention of the committee to confer upon him a cadetship of the second class, and in accordance with the request made by my friend, Mr. J. Benzley, who called upon me on the subject some months ago at the Admiralty, we have of course the greatest pleasure in substituting a cadetship of the second for one of the first.

I am happy also to be able to say that my colleague and friend, Mr. J. Benzley, in whose hands the appointment of second class cadetship was kindly placed, has placed an additional cadetship at my disposal,

and I have the greatest possible pleasure in handing it to the committee for the cadet whose name is Daley, and who, I am told, was within a very few marks as high in the examination as the cadet who had the good fortune to surpass him. I have the greatest pleasure in making this announcement, because I understand that Mr. Daley has endeared himself to his messmates on board this ship.

Mr. Corry then alluded to the remarks made at the prize distribution last year by Mr. Graves, M.P., who said that the line which divided Her Majesty's navy and the mercantile marine of this country was a very narrow one in the port of Liverpool, and that the *Conway* bridged that line; for there were associated on board that vessel those who were (Mr. Graves trusted) to become conspicuous in both services. These words suggested to his (Mr. Corry's) mind the idea that no ship could be better appropriated to the purpose to bridge the interval between the royal navy and the mercantile marine than a ship bearing the name of the *Conway*. One of his earliest and dearest friends, Captain Fair, who was conspicuous for his gallantry, and who from the line of master had been promoted to the executive branch of the service, died in command of the frigate *Conway*, serving at the Cape station. He mentioned this because many of the boys before him, though intended for the mercantile service, might yet probably rise to distinction in the royal navy. And here (Mr. Corry continued) I would wish to impress upon your minds that however great may be the knowledge which you acquire on board this ship, no matter how deeply the foundations may be laid, of skill in navigation and seamanship, and whatever else is necessary to form an accomplished sailor, all will be comparatively of little avail unless accompanied by those high moral qualities which are more especially requisite in those who are destined to command. It is almost presumptuous in me to endeavour to instil this into your minds, because nothing can be more beautiful than the language in which Her Majesty has endeavoured to convey the same lesson to you, the language in which she has expressed her object in conferring upon this ship a gold medal as a reward for the distinguished conduct of the boys on board this vessel. I may be permitted to specify, among other qualities, that you must have a high sense of honour to be good officers, you must be true and just in all your dealings, and when you leave this ship and become exposed to the temptations of life, you must (which is of all things the most necessary qualification of a sailor) be strictly sober; because you cannot too often remember that even one single act of intemperance on your part, whether as the officer in charge of a watch, or in command of a ship, might lead to the loss of all the property, and the still more valuable lives which might be committed to your charge. I am happy to know that the instruction given to you on board the *Conway* is well calculated to qualify you in all these moral and intellectual respects, and I wish you, moreover, to bear in mind that as the mercantile marine of this country is the main source of England's wealth and power, it is a duty which you owe to your country, no less than to yourselves, to make the best use of your time

on board this ship, and to qualify yourselves, so that when you are appointed as officers in the mercantile marine, you may even elevate its character to a still higher degree of perfection than that which it now enjoys.

The delivery of the prizes was then proceeded with. Her Majesty's gold medal was awarded to William Cowley, and the second prize (a binocular glass) to John F. Marshall, who also gained the Admiralty nomination to a naval cadetship. The Queen's letter relative to the prizes instituted by Her Majesty was read. It stated that Her Majesty's object was to assist in encouraging those principles which best qualified boys of the school to become hereafter officers of the Royal Naval Reserve, and thus attach themselves to Her Majesty's service; and, secondly, to facilitate the entry into the royal navy of the boys who obtained the cadetship offered to them by the Board of Admiralty. The prizes consist of a gold medal, open to boys who have been one year on board the ship, and to be awarded to the boy who receives the highest number of votes from his school-fellows. The qualities sought to be rewarded are self-respect and independence of character, kindness and protection to the weak, readiness to forgive offence, and, above all, fearless devotion to duty and unflinching truthfulness. Her Majesty's prize given to boys who compete for cadetships in the navy consists of a binocular glass, suitably inscribed, and a sum of thirty-five pounds towards the expenses of the boy's outfit. Addresses were given by Mr. T. B. Horsfall, M.P., Mr. Laird, M.P., Admiral Milne, etc.

Plymouth, through the medium of the *Western Morning News*, complains that she cannot get her share of the work done for iron ships, while her dock accommodation as well as her iron and steam resources for that purpose are as good as they are at many other places. With the view of assisting to make this known among our nautical readers we preserve the following:

"There seems to be a misunderstanding, unintentional or wilful, among the Channel pilots respecting the capacities of the port of Plymouth for the repair of iron ships. Wooden vessels of course it is well known can be set to rights at Plymouth, but we have lately heard of a case in which the captain of an iron steamer which needed repair was met by a pilot outside Plymouth, and in reply to inquiries, was assured that there were no facilities for repairing his vessel in this port, and the steamer consequently turned her head to the French coast. It cannot be too widely known that although iron ships are not built at Plymouth, the port possesses wet and dry docks in which the largest merchant ships may be safely placed, and two firms, the Plymouth Foundry Company and Messrs. Willoughby, by either of whom the most extensive repairs of iron ships can be expeditiously effected. Quite lately this has received several practical illustrations, and as misconception appears to prevail on the subject, it would be well if efforts were made to bring the real state of the case before the owners and captains of iron vessels, both British and foreign. The

capabilities of Plymouth for performing this class of work quickly are exceptionally good, for we believe that in urgent cases competent hands are to be had from the Keyham steam yards. In this, as in other matters, the western counties are suffering from the want of information respecting their commerce, their capabilities, and their beauties, which too generally prevails."

Who could have imagined that, at this advanced period of our history, we should have met with a statement of the death of a daughter of our late great circumnavigator, Captain Cook, and yet here is the announcement from the current journals of the day:—

"The death is announced, in the parish of St. Martin, Colchester, of Mrs. Ann Rumsey, widow, in her 104th year. It is an interesting circumstance that she was the daughter of the celebrated circumnavigator, Captain Cook, who was massacred by the natives of Owhyhee, in the South Sea Islands, and that she was born only a few years after the accession of George III. to the throne of England."

In our latest numbers we have been treating on those magnificent islands of his discovery, and named by him the Sandwich Islands (after the Earl of Sandwich, then First Lord of the Admiralty) the volcano of which is in our present number, the subject of wonder, as presenting the most magnificent spectacle of its kind throughout the world, and the island of it being that in which he lost his life on the 13th of February, 1779.

THE CAMPHOR TREE.—It is something more than a wonder that a tree, in itself so valuable, in its productions a necessity so absolute, and so entirely susceptible of successful cultivation in the U. States, should so long be totally neglected by our agriculturists. As the camphor tree is quite as hardy as any of our apple trees, there is, perhaps, no good reason why it should not succeed well wherever the apple tree will grow. It is indigenous to all parts of China, Japan, Formosa, Burmah, Chinese Tartary, and flourishes even as far north as the Amoor country; but it is found in the greatest abundance along the eastern coast of China, between Amoy and Shanghae. In the districts of Kwang-tung and Fu-chein it grows in dense forests, the trunks attaining a size equalling that of any of our North American forest trees. The principal market for camphor lumber is Amoy, where some boards are thirty inches in width. The camphor gum of commerce does not in any case exude from the tree, as has been so generally supposed, but is obtained from the leaves, twigs, and smaller roots, by distillation.

NOTICES TO CORRESPONDENTS.

Steam Whaling Ship "*Jan Mayen*"—Her commander will hear from us.

Admiral Smyth's "*Sailor's Word-Book*" is now published.

ERRATA.—In our last number two typographical errors have appeared just where they should not. In page 511 line 13 from bottom, for "sun" read "run," and in line 5 from bottom, "Broadwood" should be "Burdwood."

Nautical Notices.

[Communications for the Editor of the *Nautical Magazine* to be addressed to him at 31, Poultry.]

PARTICULARS OF LIGHTS RECENTLY ESTABLISHED.

(Continued from page 522.)

Name.	Place.	Position.	F. or R.	Ht. in Ft.	Dist seen Mls	Remarks, &c. Bearings Magnetic.
44. Para River	Brazil	... ..	...	...	...	See Note (a).
45. Codling Bank	Ireland	W. Coast	R.	...	...	See Note (b). Red light, period 20 seconds.
Wicklow Swash		Discontinued	...	...	...	
Wicklow Head		Altered	...	...	...	See Note (c).
Arklow Bank		... ..	F.	...	...	Two lights, see Note (d).
Blackwater Bank		Altered	F.	...	...	See Note (e).
Lucifer Shoals		... ..	F.	...	...	See Note (f). Red light.
46. Africa Rock	Italy W. Coast	42° 21' 5" N. 10° 4' E.	F.	56	11	Est. 15th September, 1867, near Monte Christo, see Note (g).
47. Assateague Island	United States America	37° 54' 8" N. 75° 21' W.	F.	150	19	Est. 1st Oct., 1867, see Note (h).
48. S.W. Bank	The Cape	... ..	...	...	...	See Note (i).
49. Berdiansk Spit	Black Sea	... ..	...	...	...	Buoy, see Note (a 2).
50. Ramsgate	England	East Pier	Fl.	25	...	Est. 15th Oct. 1867. Intervals of 5 seconds light, and 5 seconds darkness
51. C. Spartivento	Italy S. Coast	37° 55' 7" 16° 3' 3"	R.	210	20	Est. 10th Sept. 1867. Revolving once a minute.
I. Maritimo	Sicily W. Coast	37° 57' 7" 12° 3'	F.fl.	240	21	Est. 1st Oct., 1867. Flash every 4 minutes.
52. Bunt Head N.W. Buoy	England	Downs	...	...	...	Altered in position, see Note (a 1).

COASTS OF THE UNITED STATES.

59. Hooper's Strait	Chesapeake Bay	Light on screw-piles	...	...	9	Est. 14th Sept., 1867.
60. St. Andrew's Sound	L. Cumberland Island	30° 58' 6" 81° 24' 6"	F.	73	14	Re-established 1st Sept., 1867.

F. Fixed. F.fl. Fixed and Flashing. R. Revolving. I. Intermitting. Est. Established.

(a) *Buoys at the entrance of the river Pará, Brazil.*—Two buoys have been placed at the eastern entrance of the river Pará; viz.:

1. A *white* conical buoy, with staff and vane, on the north side of the Braganza bank in $7\frac{1}{2}$ fathoms water, fine sand lies E.N.E. $1\frac{1}{2}$ miles from the north-west part of the bank, North nine miles from Tajoca Point and N.W. by N. nine to ten miles from the land of Curuza island. Position assumed in lat. $0^{\circ} 26\frac{1}{2}'$ S., $47^{\circ} 53'$ West.

Shoal ground also extends nearly two miles E.N.E. from this buoy.

2. A *red* conical buoy with staff and vane, on the east side of the Tajoca bank, four to five miles West of the above buoy, bearing N.N.E. fourteen to fifteen miles from Taipu point. This in about lat. $0^{\circ} 26'$ S., long. $47^{\circ} 57\frac{1}{2}'$ West.

DIRECTIONS.—Vessels from the eastward bound for Pará when on the meridian of Curuza island, and nine or ten miles from it, should see the white buoy of the Braganza bank to the westward three or four miles; they must pass to the northward of it, and having cleared the north-western part of the bank (known as the Cotovello point), keep more to the southward passing between the Braganza and Tajoca banks.

All Bearings are Magnetic. Variation $1^{\circ} 50'$ West in 1867.

(b) *The Light vessel on the Codling Bank* will be placed about three and a half miles S.E. by S. from the south end of the Codling Bank, carrying a *red revolving* light, attaining its greatest brilliancy every *twenty seconds*.

She will have three masts with a globe over a half globe at her mainmast head. The hull will be painted black with a white stripe, and the words *Codling Bank* in white letters on her sides.

(c) *The Wicklow Head Light* will be changed from a fixed white light as at present, to an *intermittent white* light, showing alternately, *ten seconds bright and three seconds dark*.

(d) A Light vessel will be placed on *Arklow Bank*, about three and a quarter miles S.E. by E. $\frac{1}{2}$ E. from the North end of the Arklow Bank, carrying *two fixed* white lights; one on the mainmast thirty-eight feet, the other on the foremast twenty-two feet above the level of the sea.

The vessel will have three masts with a globe on her mainmast head. The hull will be painted black with a white stripe, and the word *Arklow Bank* North in white letters on her sides.

2. The vessel off the south end of the Arklow Bank will be moved about two miles S.S.E. $\frac{1}{2}$ E. from her present position, and her light will be a *white revolving* light attaining its greatest brilliancy every *minute* instead of every *half minute* as before.

The vessel will have three masts and carry a half globe over a globe at her mainmast head. The hull will be painted black with a white stripe, and the words *Arklow Bank South* in white letters on her sides.

(e) *The Blackwater Bank Light Vessel* will be moved about one and a half miles East of her present position, and will remain a fixed white light as at present.

She will have three masts and carry two globes at her mainmast head instead of one, as at present. The hull will be painted black with a white stripe, and the words *Blackwater Bank* in white letters on her sides.

The above changes will be made by or about the 10th of October, 1867.

(f) On or about the 1st day of May, 1868, a Light vessel will be placed near the Lucifer shoals, on the coast of Wexford, about midway between Tuskar Rock lighthouse and the Blackwater Bank light vessel, carrying a *fixed red* light.

She will have three masts and a globe at the mainmast head. The hull will be painted black with a white stripe, and the words *Lucifer Shoals* in white letters on her sides.

(g) The light will be a red light, and the lighthouse built in the centre of the rock, on Mitchell's system, with iron buttresses.

(h) The lighthouse is in the same position as before, about two miles from the south-west point of the island. From the centre of the Winter Quarter shoal the light bears W. by S. $\frac{1}{4}$ S., eleven miles and a half, and from the Chincoteague shoals North to W.N.W., five miles.

All Bearings are Magnetic. Variation 4° 30' W. in 1867.

(i) The Spanish Government has given Notice, that the Spanish Merchant vessel *Justa*, from Macao to Havana, discovered a patch of shoal ground about five leagues to the S.W. of the Cape of Good Hope.

Several casts of the lead were taken during a calm, and fifteen and a half to thirteen fathoms found with rocky bottom; from the latter depth the water suddenly deepened and no bottom could be found.

At the time of the first sounding in fifteen and a half fathoms, the Cape of Good Hope lighthouse bore E. by N. magnetic (N. 49° E. true), and the assumed distance from the Cape was sixteen miles.

This bearing and distance would place the bank in lat. 34° 31' S., long. 18° 15' East of Greenwich.

It is intended to examine this reported bank, the results of which will be communicated.

(a 1) The Bunt head shoal buoy in the Downs, now lies in five fathoms at low-water spring tides with the following marks and bearings:—

The first mill south of Sandown Castle
on with Northbourne Mill . . . W. $\frac{1}{4}$ N.

The North end of the new Coast Guard
station in Old Stairs bay touching
the channel end of St. Margaret's
Church . . . S.W. by W.

Gull light vessel . . . N. $\frac{1}{4}$ E., distant nearly 1 $\frac{1}{2}$ m.

South Brake Buoy . . . N.W. by W. $\frac{1}{4}$ W. 1 mile.

Bunt Head Buoy . . . S.W. nearly 1 mile.

All Bearings are Magnetic. Variation 19° 50' Westerly in 1867.

(a 2) With reference to the extension of Berdiansk spit, which was given in the Hydrographic Notice, No. 15, issued from this office on the 15th day of August, 1867, further information has been received, that, in addition to the red beacon marking this danger, a red buoy has been placed in twenty-two feet water, with Berdiansk lighthouse bearing E. $\frac{1}{4}$ N., distant one mile. See former Notice.

All Bearings are Magnetic. Variation 2° 30' West in 1867.

JAPAN NAVIGATION.

JAPAN.—INLAND SEA AND WEST COAST OF KIOUSU.—The following additional information referring to the China Pilot, 4th Edition, on the Inland Sea and the West Coast of Kiousu, is from Commander Charles Bullock, H.M.S. *Serpent*, June, 1867.

[All Bearings are Magnetic. Variation 4° W. in 1867.]

INLAND SEA.—SIMONOSEKI STRAIT. See Admiralty Chart, Simoneski Strait, No. 532; also China Pilot, 4th Edition, page 481.

Vessels passing Hiku Flat of more than fifteen feet draught must keep the leading marks well closed, or a little overlapping.

The Middle channel of the East entrance is still shallowing.

The South channel is improving.

OSAKA. See Admiralty Chart, Inland Sea, No. 2875; also China Pilot,

page 492.—The city of Oosaka stands on the left bank of the main stream of the Yodo ngawa, three miles from the sea. The river taking its rise in the great inland lake, Biwa, after flowing about S.W. for thirty miles, enters the gulf of Oosaka by several channels. At the lower or north-western corner of the city, it divides into two branches—the Ajikawa, as the Yodo is here called, making for the sea; the other branch, the Kishungawa, flowing southward disembogues three miles lower down the gulf; these two branches are navigable by junks of moderate size, but the heavier have to discharge cargo in the roadstead.

Oosaka is intersected by several shallow canals, navigated by the flat boats of the country. The castle of the Tycoon is on the north-east of the city, overlooking the river.

The Foreign concession named Ebisu jima or Kawa nguchi occupies the angle formed by the Aji and Kishu branches; a position known by lofty trees; the right of building is confined to this site, but the right of residence extends over the contiguous suburb westward. It is two and three quarter miles above Fort Temposan, at the river's mouth, and two miles below the castle.

THE RIVER AJI is shallow, but admits ships' boats as far as the castle; it has a bar, which at unusually low tides would be nearly dry; at very high tides, seven feet might be carried over. The channel is marked by large piles, the two outer with triangular vanes to distinguish them; the shallowest part is just *outside* these outer beacons, to avoid a shoal extending south-west from the other; when inside, the deep water is close along the groynes on the south side, which always show. There is generally three feet more water in the lower part of the river than on the bar.

DIRECTIONS from within the bar.—Keep the south bank of the river: this leads up in a nearly direct course to the Tycoon's castle. Above the first bridge the river turns off sharp to the south; this is the Kishu branch. Keep close past the Concessions, but in the same direction, for above this the river has two distinct channels, separated by narrow islands and shallow sand banks, which can seldom be crossed.

Boats may be obtained just above the fort, or at Ichioakashinden on the left bank, miles higher up.

LIGHT.—The large fort of Temposan, on the south point, commands the entrance of the river. It is a high turfed earth-work, scarped with masonry, and is a conspicuous landmark, the shores being very low; on the parapet of its western salient is a small wooden lighthouse, shewing a fixed light. There are no towers.

OOSAKA ROADS.—The depths in the roadstead are extremely regular, diminishing gradually over a soft mud bottom; the holding ground is so good that it is considered a vessel could ride out any gale in safety. The shores are everywhere clean sand, (as are the river bars,) but there is mud at a cable from low water line. The best anchorage is West of the Temposan or Oosaka lighthouse.

THE KISHU NGAWA.—Two miles S.S.E. of Oosaka bar is the bar of the Kishu river. At low-water mark a mile from the shore off the north point of its entrance a small star fort is being constructed. The bar has not been closely examined, but it is crossed by larger junks than that of the Adji, for Oosaka.

SAKAI.—LIGHT.—S. by E. four miles from the Sakai river, entering the sea, two green batteries; it has no light is exhibited from a wood

HIROGO AND KOBE. See Chir

Temposan is the mouth of the river, two miles extending from the bar at entrance. A small fort is situated here. Foreign settlements

ment at the head of the northern bay of Kobe, which is somewhat smaller and shoaler than Hiogo bay, but its shores are steep, and if less sheltered in south-west winds is less exposed to the east.

The Japanese Government have two docks at Kobe point, where vessels of five hundred tons, if lightened to seven or eight feet draught, can be taken in for repair.

Large timber, chiefly cedar (Su-*ngi*), is abundant, and suitable for ship building purposes, spars, etc.

The fresh water obtained at Kobe is good, that of Hiogo is indifferent; the price is two *itsboos* per ton.

Supplies of all kinds are at present extremely dear, coal especially, for which fourteen to eighteen dollars a ton is usually demanded, ten or twelve being a fair price.

DIRECTIONS.—If entering Hiogo at night from the west, steer for Hiogo point, which, though extremely difficult to see if it be at all dark, is nevertheless bold; or, pass it at a moderate distance, and when the shipping lights bear N.N.W. or N.W. steer for them, or if bound for Kobe steer north. In thick or rainy weather, having run the distance haul in for the shore as convenient and anchor in eight to five fathoms. Observe that the tide runs along the shore nearly two knots at springs, its direction unknown. Near Akasi strait it runs even stronger.

The coast as far as Tree point, seven miles eastward of Kobe, is safe, the shore steep into four fathoms, except the bay directly east of Kobe, where a sand bank of less than two fathoms extends half mile off shore.

AKASI STRAIT.—Two rocks, show at low water, in the fairway between Akasi Strait and Hiogo, about three miles E. $\frac{3}{4}$ N. of the north point of Awadji; two sunken rocks are on the same bearing at one and a half miles from the same point of twenty or twenty-six feet; they are accurately laid down on a late survey by *Japanese naval* officers. The north point of Awadji kept west until the end hill of the Hiogo range (bordering on the sea) bears N.E. leads well clear of them.

TIDES.—It is high water, full and change at Hiogo at 7 h. 15 m. Springs rise 5 ft. 8 in.; neaps 4 ft. 3 in.; neap range 2 ft. 6 in. The range of any day seldom exceeds 5 ft. at springs or 1 ft. 6 in. at neaps.

At Oosaka bar no perceptible differences in the range, from the above, could be observed.

At Oosaka Concession the establishment is 8 h. 17 m. Spring rise thirty inches, neaps six. The flood stream does not reach the Concession.

At neaps there is only one tide in the twenty-four hours.

A strong S.W. wind with low barometer may raise the level of Oosaka gulf two feet.

The directions of tidal streams, sometimes strong off Hiogo point, are not yet ascertained. In Oosaka roads they are weak and irregular.

WINDS, WEATHER, ETC.—Land and sea breezes occur in the summer season; the latter sometimes raising too much sea on the bar for ships' boats to cross; these breezes are quite local.

From late autumn to early spring, north-west winds with dry, clear, bright, weather prevail: at this season small pox is common, especially in Hiogo, and this kind of weather is considered highly conducive to the spread of the disease. At the equinoxes, gales occur which sometimes hang to the S.W. for a day or more, but they can scarcely be considered dangerous, veering almost invariably with the sun, and blowing hardest from between west and north. It appears doubtful whether they ever blow home, the shores of the gulf bearing no evidence of it.

After March expect unsettled, changeable weather: with haze and occasional rain, it continues a short time.

In May, 1867, the barometer twice fell from 30.10 to 29.50, followed by a few hours rain; on the first fall the scud from the south and S.W. indicated a high wind, which did not fetch home into the gulf; the second was due to a heavy gale which occurred on the west coast. The rainy season is in July.

GREAT SHOAL. See China Pilot, page 490.—On the Japanese survey the Shika-no-se, a shoal of one fathom appears W. $\frac{1}{4}$ N., eight and a half miles from the north point of Awadji. Soundings of two fathoms extend to a mile east of it, deepening to five, eight, and eleven fathoms with some irregularity. It is said that the shoal extends five miles, but it would seem to be narrow and steep on its north and south edges; the nature of the bottom is not known.

HARIMA NADA ANCHORAGE. See China Pilot, page 486.—Hanamura Bay is not a good anchorage, but that recommended in Sozu-sima on the western side of the Yosino promontory, is both good and convenient in six or eight fathoms; bottom fine sand and shells.

BINGO NADA.—In the northern route, the Admiral's bank off Taura, should be passed on the south side; the point east of Taura if kept N.E. by E., (when a small wooded island will be seen open of it,) will lead clear. There is another bank of the same kind extending a mile eastward of Okuno. A depth of nine feet is found on the Admiral's bank.

TIDES OF BINGO NADA.—It is high water full and change, as follows:—

St. Vincent Channel	.. ..	1 h. 27 m.	flood west, ebb east.
Takami	.. ..	1 h. 35 m.	" "
Mutsu sima	.. ..	1 h. 45 m.	direction uncertain.
Middle of Bingo Nada	.. ..	11 h. 0 m.	" "
Imaharu	.. ..	1 h. 0 m.	flood east, ebb west.

At Imaharu, in the southern route, springs rise ten feet; neaps, about eight feet.

MIZIMA NADA. See Admiralty Chart; Inland Sea, No. 2875.—The small islands called Ai sima are incorrectly laid down on the Charts. The north-western, a conspicuous round island is a mile in extent, the other two should be erased and one placed half a mile south of the position.

ANCHORAGE.—In the Bay south of Simonamba point there is good anchorage in six to nine fathoms with the north point of Kosii bearing W. by S. $\frac{1}{4}$ S., but the anchorage at the position shewn on the chart one mile south of this, is bad.

KIUSIU—WEST COAST. APPROACH TO NAGASAKI.—It is stated by Captain James of the steamer "*Emperor*" that a rock, which dries, is situated on the dotted track of H.M.S. "*Argus*," lately placed on the chart N.E. of the Kareki Islands and south Apex Straits.

THE BROTHERS.—The "*Serpent*" sounded in the position of these doubtful dangers with even bottom in from fifty-five to sixty fathoms fine sand. Their existence has not been credited for some years.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY,
in September, 1867.—Sold by J. D. Potter, 31, Poultry, and 11, King
Street, Tower Hill, London.

733. Red Sea, Amphila Bay. Capt. Weatherhead and H. Salt, Esq.
1810. 1s.

733. " " Howakel Bay. H. Salt, Esq. 1810. 1s.

733. " " Ansly Bay. H. Salt, Esq. 1810. 1s.

2661. a, b, China Sea, Northern portion from Cam-rauh Bay to Formosa
and Mindora Straits, various authorities to 1867. 5s.

EDWARD DUNSTERVILLE, Commander, R.N.
Hydrographic Office, Admiralty, 15th September, 1867.

THE
NAUTICAL MAGAZINE

AND

Naval Chronicle.

NOVEMBER, 1867.

THE CITY OF PARA.

THE visit of H.M.S. *Sharpshooter*, Commander Bax, to the town of Cameta, which appeared in our last number, is an important introduction to the opening of commerce in a part of the world which has hitherto excluded all foreign vessels. Happily it has been determined by the Emperor of Brazil to terminate this exclusiveness, and the amount of commerce which will pass through that port alone, owing to its easy access from sea, will form a large portion of the whole which flows through all the various ports named in the Emperor's decree. Indeed, to us it appears that if a vessel of war can get up the river so easily as the *Sharpshooter* seems to have done, the difficulties of our merchant vessels to do the same will be very few. Welcome appears to await them if we judge by the *Sharpshooter's* reception, and by keeping to the eastern bank for thirty miles above Para the passage to Cameta is made.

The directions for the river which we have published from time to time, of course are found in the pages of those books expressly devoted to that navigation, at the head of which, and superior to all, from the great care in its compilation, is the *Brazil Pilot*, published by the Admiralty. But we may allude to the mishap of the *Sharpshooter's* canoe mentioned in our last, and which circumstance, from a paper in our October number for 1846, seems of common occurrence at the mouth of the Amazons. We therefore caution our Nautical readers visiting that river to be very circumspect in the use of their boats, and as some interest will naturally attach to the city of Para itself, we give also a picture of it as it was in 1830. At the same time we shall be glad of any account of it as well as of the town of Cameta from any of our readers, as it is at the

present time. We here annex the Decree and the remarks it occasioned in Mitchell's *Maritime Register*.

"On the 3rd of July last a Decree was issued by the Emperor of Brazil ratifying a previous Decree, 7th of December, 1866, and declaring the navigation of the River Amazon and its confluent, and of the River San Francisco, from and after the 7th of September, 1867, free to the Merchant vessels of all nations. The rivers opened by this Decree are the following:—The Amazon, as far as the village of Tabatinga; the Tocantins, as far as the city of Cameta; the Tapajoz, to the city of Santarem; the Madeira, to the town of Borba; the Negro, to the city of Monaos; and the San Francisco, to the city of Penedo.

"It will be seen, by consulting any good map of South America, that these rivers penetrate the interior of Brazil, west, south, and north-west from the Atlantic to the confines of Parana and Paraguay in one direction, and to those of Bolivia, Peru, and Equador in the other. The opening of these rivers, carrying navigation for nearly 3,000 miles from the Atlantic, means not only the opening up of the whole interior of South America, but the establishment of a fluvial communication between the Pacific and the Atlantic States of that Continent. We have less, however, to do at present with the results of this great achievement than with the regulations prescribed by the Brazilian Government for controlling and giving effect to it. For the collection of the Customs' revenue, Custom-houses have been established at the afore-mentioned towns of Cameta, Santarem, Borba, Monaos, and Penedo, while for the River Amazon the Custom-house will be situated at San Paulo de Olivença. The majority of these Custom-houses are situated near the Atlantic, so that vessels entering may get their business dispatched at once, and proceed on their voyages inland, or discharge into the craft specially employed in the river navigation. These Custom-houses, moreover, having the same authority as to imports and exports as the other collectorates of the Empire, can grant entries and clearances for all descriptions of goods, whether native or foreign, exports, imports, and for re-exportation, and there is a special provision against re-exportation in the Amazon or its confluent of foreign goods, except where there is a Custom-house.

"Three depôts or bonded warehouses for goods will be established at Manaos, Borba, and Tabatinga, as soon as the fiscal and police regulations (which form no part of the Decree under consideration) are issued. From these warehouses goods may be re-exported to other Custom-house depôts, to the National Custom-house, or to foreign Ports, without paying duty, and may be entered and forwarded for consumption, paying the respective duties. The Decree reserves to the Brazilian authorities the right of prohibiting importation, deposit, or transit, and exportation, but only under 'extraordinary circumstances, and in the interest of the public health and safety.' The Customs' regulations will be enforced peremptorily by the forfeiture of the ship and cargo where there is any proved attempt to evade

them, and this penalty attaches to any and every attempt at 'fraudulent importation, exportation, or transshipment'—an offence which, it is anticipated, may be committed clandestinely in the small bays or 'other territorial waters of the Empire.' It is manifestly the intention of the Government of Rio, while opening the interior navigation of Brazil to the flags of all nations, to facilitate the operations of Trade by providing a sufficient Customs' machinery. Thus, where there happens to be no Custom-house or place for the collection of revenue, termed indifferently 'station, agency, post of fiscalisation, and registry,' vessels shall receive on board one or more Customs' officers to take note of the goods shipped, their quantity and quality, and of other matters necessary for the collection of the duties at the Port or Ports where the duties are payable. These duties are to be paid in accordance with the ship's manifest, except—and this is a matter of some consequence to our Merchants and Shipowners who may engage in this new Trade—where goods are intended for transshipment or re-exportation, in which cases the declaration of the Owners or Consignees will be sufficient, and the manifest need not be produced.

"The opening of the Amazon and its confluent is a measure in pursuance of the policy which dictated, some time since, the opening of the Brazilian Coasting Trade. It is, perhaps, to be regretted that the most recent change in the Navigation Laws of Brazil was not made at once complete. The present Decree contains a reservation in favour of national vessels which is objectionable in principle, and will, no doubt, shortly be abandoned. This is a provision which gives to national vessels a monopoly of the carriage of all goods 'from one to another fluvial Port, and from these to that of Para (near Maranham), or from the fluvial to other Ports of the Empire,' except of goods belonging to the cargo of a foreign vessel which carries a permit from one Port to another to discharge or tranship, or which carries passengers and their baggage. This is the application of the principle of a reserved Coasting Trade to the River Trade of Brazil and the adjacent regions, and, so far as it is so, is a mistake. Allowing for this, however, the opportunity afforded by the opening of the Amazon and its confluent for a new and vigorous Commerce is immense. With these vast highways, and with that of the Plata, the Parana, and the Paraguay, open to the Commercial fleets of all nations, we shall be within reach of the produce of the whole interior of South America—a region, as we are told, of, for the most part, unbounded fertility and vast natural wealth. But besides this there is the prospect, neither remote nor uncertain, of perfecting the connection between the two oceans. Already Brazilian steamers of one thousand tons ascend the Amazon to Nanta, in the Republic of Equador, while by another confluent, the Pastaza, vessels of three hundred tons navigate to within one hundred and fifty miles of Quito, and about the same distance from the Port of Guayaquil, on the Pacific. Considering the vast extent of territory thus opened to Commerce, the character of the regions traversed by the Amazon and its confluent,

their great natural resources, and the facility of access, the Decree dated from the Palace of Rio de Janerio on the 3rd of July last ranks amongst the most important documents of our day relating to Commerce."

[One consequence of the above edict will be to make the city of Para itself better known than at present to our Commanders, and we therefore annex, as of some service to them, our own account of it, as it appears in the voyage of H.M.S. *Chanticleer*, from the notes of her Surgeon, Mr. W. H. Webster, a gentleman of much observation and discreet judgment, retired from service.—ED. *N.M.*]

On Sunday, the 5th of September, 1830, we sailed from Maranham, having previously hired a pilot to conduct us to Para for the sum of fifty pounds, on account of the intricate navigation of the river. We kept at a moderate distance from the coast until the morning of the 7th, when we stood in and made the land near the mouth of the river. In a few hours afterwards we found ourselves in the "Maranhon," the name bestowed on it by the early navigators, who in sailing along the coast were surprised on finding the water fresh. They therefore very expressively named this mighty water, "Mare Non"—"Not the Sea," its freshness being the only indication that they were not in the ocean. It is now better known to us as the Amazon.

We entered the river by the smaller or eastern branch, the only navigable one for large ships, as a bar lies across the principal mouth, or the great western branch of the river. It may be observed here, that the island of Marajo, which is nearly a hundred miles in circumference, lies in the mouth of the river, dividing it into two unequal branches. The greater body of water passes to the westward of it, while the deeper and navigable channel flows to the eastward. The island Marajo is a low, flat, alluvial formation, covered with brushwood and grass, and abounding in cattle. This luxuriant island supplies Para with cattle and horses. In the rainy season it is much flooded, and is peculiarly unhealthy when the waters have quitted it, and the sun begins to exhale the malaria. At this time violent remittent fevers prevail. It is overrun with alligators, snakes, and wild beasts.

The mouth of the Amazon is one hundred and thirty miles in breadth, and its course extends through a distance of three thousand four hundred miles, rising from the mountains of Peru. But the sources of this river and its various tributary streams are involved in much obscurity, and much time and patient investigation will be necessary to acquire a correct knowledge of the sinuosities of this majestic stream. The eastern branch, which we had entered, is only twenty-five miles broad. The land on each side is low, and we kept along the eastern shore, which displays a boundless continuity of shade and one uninterrupted scene of forest green skirting the water edge, and extending with one level surface to the horizon. Accustomed as we were to the continual monotony of such scenery, that of the Amazon produced no new feelings among us farther than the gratification of being able to obtain fresh water alongside of the vessel. This water,

however, was extremely muddy, but tranquil, and without the heavy swell of the ocean.

We had a fine breeze from the N.E. which gradually subsided towards evening; nevertheless we made good progress up the river. The navigation is intricate and dangerous, and we had some difficulty in avoiding the numerous shoals and sandbanks, owing to the strength of the tide. We passed Selina, the pilot station at the mouth of the river, and a few villages which afforded an agreeable break in the continuous line of the woods. By the evening we had reached within thirty miles of Para, and anchored in the river for the night. Early on the following morning we got under way and proceeded onwards. As we continued our course, we found the river gradually become narrower, and we had a nearer view of the banks; but we found the same character as at first, a low rich country covered with dense forests. As the little *Chanticleer* moved gracefully up the stream the utmost tranquillity prevailed around, and her form was reflected on the unruffled surface of the water. Occasionally we passed a small islet; and having left a fort on the eastern side of the river intended to guard the navigation, the city of Para appeared before us, and in a short time we gained the anchorage.

A rapid tide sets up the river at the rate of between four and five miles per hour and this flows with a current stronger than the ebb for seven hours, while the latter does not run more than four or five. The water is at all times fresh and may be used, although it is turbid and filthy. This prevalence of the flood tide, both in strength and duration over the ebb, may be accounted for in some measure by the immense breadth of the river's mouth at the seaside, and its sudden contraction here (fifty miles up), where it is two miles broad. The rapid tide is dangerous to boats in consequence of their liability to be drifted on to the cables and warps of the shipping. One of our boats in coming alongside, was drifted in contact with a boat at the guest warp, and was taken completely over it without any mischief being done.

The banks of the river are exceedingly muddy, affording but little facility for landing, and where they do allow of it houses are generally erected, the advantage not being disregarded. In the lower parts of the river are some sandy beaches. The chief novelty that we found was the number of thatched and cabined canoes of the country, and the small river craft with their lofty spindle masts and thin cotton sails, having some resemblance to Chinese vessels. It is not unusual to see them with a large mat or a bush with all its leaves, to answer the purpose of a sail in these canoes. We found a Brazilian brig of war in the river, and a prison ship, besides several Portuguese vessels. The principal business of the river seems to be carried on in these canoes, which are continually arriving and sailing, and literally crowd the shore near the town. They bring the produce of the country from all parts, and come from a distance of six and seven hundred miles from up the river. They are navigated by various native tribes of Brazil Indians, each canoe generally containing a whole family or more

of people. It is quite common to see little low canoes, nearly even with the surface of the water, containing a man in the bow with his paddle and a woman in the stern steering with another, while their children, a pack of little copper-coloured urchins, are crouching beneath a matted awning amidships. The larger canoes have a raised awning abaft, in which hammocks are slung, in these the canoe-men may be seen lounging and swinging all day smoking or feasting.

The city of Para lies on the right bank of the river Amazon, at the distance as before stated of about fifty miles from its mouth. As it appears from the anchorage in the river, it presents nothing particularly attractive or conspicuous, except its numerous churches; no lofty ranges of buildings are to be seen in this city of the Western world, but environed by wood and the waters of the river, and built on lower ground it has altogether a humble appearance. It occupies the bank of the river about two-thirds of a mile and is half that in breadth, the highest point of ground, that on which the church of St. Ann is situated, being about seventy feet above the surface of the river. The city was founded by the Jesuits in 1615, and contains at present, about twenty-two thousand people.

If at the first sight of it Para does not convey any exalted idea of its grandeur, certainly an intimate acquaintance with it is still less likely to do so. It is dull, noiseless, and cheerless; without vehicles or the activity of business. The streets are laid out at right angles to each other, but they are narrow; and the houses, generally about two stories high and of a moderate size, have latticed blinds for windows, which add still more to the sombre effect of the whole. None of the streets are paved, if we except some few, which have a quantity of rough pebbles in them; of course they are neither lighted nor cleaned, and towards the river are particularly filthy.

The city of Para is not without its public buildings, among which the cathedral takes precedence, followed by eight churches, a palace, custom-house, etc. The cathedral is built in the form of a Latin cross, and I was pleased with its structure and decorations, which were neither gaudy nor too plain. The exterior is somewhat dilapidated, but still preserves a respectable appearance. The interior is very neat, and affords ample room for a large congregation. The altar piece is good; it represents the Crucifixion; and there are several large paintings of the Apostles. The bishop's palace is in the Cathedral Square, and faces that building. It is a respectable edifice, appended to which, is a church or chapel for the domestic service of the bishop and his establishment. In the same square is a comfortable hospital, and the remaining part is filled up with a few houses. The palace, which is the abode of the President, is a handsome and commodious building, most agreeably situated on an open spacious lawn at the south-west end of the city. The interior of it is every way worthy of its purpose. Adjoining the palace are the walls of a building which was intended to be a theatre on a magnificent scale. The design was good, but the whole was a failure.

In the middle of the town is the church of St. Ann, yet incomplete,

and with the view of raising sufficient funds to finish it, a mendicant friar may be seen standing in the street all day soliciting contributions for that purpose. The church of Jos. Menerz stands close to the water-side; adjoining to it is the custom-house, and prison; and these three form the most conspicuous range of buildings in the city, but they are nevertheless by no means remarkable. The convent of St. Antonio is situated at the eastern extremity of the city. Most seaports have their arsenals, whether on a large or small scale, and whether public or private property, and therefore Para is not without one. When we were there a frigate was on the stocks, but for want of funds all work on her had ceased.

The streets of Para have nothing attractive about them. The shops and warehouses are numerous, and are tolerably well supplied with merchandize; but there is neither taste nor elegance in their arrangements; those of the apothecaries seemed to be the neatest and cleanest. The markets are held by the water-side, near the Church of Mercy, where women with vegetables and fruit herd together for the most part of the day; but butchers' meat is not to be had after ten in the forenoon, a very salutary regulation on account of the extreme heat of the place. Nor can fish be depended on, in consequence of it, for more than three or four hours after it is out of the water. The *Largada Polva*, is a large open and extensive common in the south-east quarter of the city. It is, perhaps, not the most respectable place in Para, although it is the most airy, and from the rural little cottages in it, is very pleasant. The gibbet for the execution of culprits is in this square, and also a *well* of ants.

Although Para possesses in itself few attractions, the numerous shady walks in the environs of the city deserve notice, as they form an agreeable retreat for the inhabitants. There is, however, a public walk in the city, near the palace, which is resorted to daily in the cool of the evening, for the delightful promenade it affords. The others are principally formed of rows of lofty silk-cotton trees, which bear no little resemblance to our elegant horse-chestnut trees. The mango with its pendulous fruit, and the orange and lime mingled with each other, form the sides of the walks and afford a grateful shade. The country in the immediate vicinity of Para is very beautiful, and the outlets to it are abundant. In the suburbs of the city are several elegant little villas with extensive gardens, rich in all the variety of tropical produce. The roads, which are not amiss, are lined by large spreading trees, among which may be seen here and there some little hut or cottage embowered in foliage, which in this part of the world may be considered as evergreen. I have contemplated these happy looking abodes in the course of my walks from Para; and if the minds of their inhabitants are as peaceful, nothing more is required to complete the "happy valley" alluded to by Dr. Johnson. At some intervals the eye is attracted by these little cottages, and at others by the neat villa in sequestered solitude, the country residence of some inhabitant of Para, presenting to the feverish spirits of the world a scene of happiness and peace. Here the winds are loaded with a

balmy fragrance, while the graceful palms, presenting in their various stages, forms so remote from the rest of the forest, impart grandness and sublimity to the scene.

The road to the Nazzaré Church, distant about a mile from the city, is a favourite resort of the people of Para. The church, which is built on a small scale like that of a village, is simple and neat, and most romantically situated on the skirts of a wood, with a small open area in front. In the month of October, which is no doubt well remembered by every inhabitant of Para, and anticipated with feelings of delight by the young and gay, a grand scene of festivity takes place at this little church. It is called the feast of St. Nazzaré, and is attended by every one in Para. On the arrival of the day, the fair opens under the auspices of the church, Mass is performed in the first style, and the inauguration of the whole festival is the office of the clergy. The usual business of fairs, such as frolic and feasting is the order of the day, presenting a strange incongruous mixture of folly and religion. This lasts for a fortnight to the great delight of those who frequent it, some, I believe, for the purely innocent enjoyment of dancing, and others to indulge in the common propensity for gambling. However, the whole business is closed with the benediction of a grand mass.

Para is lamentably deficient of public institutions for education, the whole town can only boast of one school, and that is under the direction of the clergy. This deficiency is evident to a stranger on going even into the first houses of the place. A city that does not boast of a single bookseller's shop is certainly something extraordinary in the present day; and where this is the case there is little hope of finding these valuable articles among the people. But of the two sexes, the most complete ignorance is found in the female, as might be expected, and it is a common thing to find those of the most respectable families incapable of either writing or reading. Such a state of things is certainly lamentable. All appears wrapped in the shade of profound ignorance. There certainly is a Weekly Gazette published in Para, but even this publishes little to the honour of her people. It is small, and is the regular channel through which the edicts of Government are circulated; the rest of the matter it contains, alas! is mostly of bad stamp, and by no means calculated to raise the character of the people. It may not be necessary to make quotations, but the Gazette is certainly not calculated to make any favourable impression on a stranger, of their morality in general; and the crowded state of their prisons is equally against them in the same point of view. Murder is not unfrequent in Para no more than other countries; but the laws are bad and badly administered, for justice is tardy, and a criminal may be in prison for several years without being brought to trial.

The currency of the province is a good criterion of its general poverty. There is no other circulating medium than copper, and even that is of the basest kind. The existing government call in, at pleasure, the old copper coin, and stamp it afresh with a crown, by which magical influence it becomes of twice its former value. Such is the wretched trash in circulation, that the stamped and unstamped pass in common;

and it often happens in payments that one dollar's worth weighs and is intrinsically worth three times as much as some of the other. It would appear that this province is the very sink of the empire in respect to currency, as all the base copper coin which is not passable in the other parts of the empire, finds here a tardy circulation. No better idea of it can be given than the fact that what passes for one hundred pounds, in copper coin, is really and intrinsically worth only eight pounds. Silver was at a premium of twenty-five per cent. ; and the very sight of a dollar when we were there was quite a rarity. Hence the necessities of life are cheap. House rent is moderate, and there are no direct taxes. The following were the market prices at the time of our visit :—meat twopence per pound, indifferent quality ; bread sixpence per quarter loaf, very good ; white sugar threepence per pound, very good ; rice one penny per pound ; tapioca one penny per pound ; spirits of the country one shilling and threepence per gallon ; coffee twopence per pound ; cocoa one penny per pound, very cheap ; a beautiful and delicious pine-apple of six or seven pounds costs threepence ; oranges threepence a hundred, basket included, which alone is worth the money ; alligator pears four for one penny ; melons twopence each. Fowls dear, being one dollar the pair ; horses are worth sixteen shillings each, and are generally fed with rice chaff. Foreign produce is by no means high at Para, the wines of Portugal and the manufactures of England being comparatively cheap.

Notwithstanding the natural riches, and the superabundant advantages of Para, it is the poorest city in the empire, and receives a subsidiary stipend from the neighbouring province of Maranhão, amounting to forty thousand dollars, or eight thousand pounds annually, to defray the expenses of its government. In consideration of this gratuity, Para receives the goods imported into Maranhão duty free, and likewise defrays the expenses of the packets and men-of-war on the station. There is something radically wrong in the government of this province, and a miserably perverted policy keeps in the back ground the capabilities and resources of the country. There can be no doubt that the Empire of Brazil is far too large to be governed well as it is. Corruption lurks in every department.

The province of Para is equal in size to France, and has an inland navigation of six hundred miles. It is at once the paradise of the Indies and Brazils according to the general opinion of the inhabitants of that great empire, which occupies the whole extent in latitude of the southern tropic. Para is sufficiently capacious to receive all the redundant population of Europe, and to maintain them in luxury ; it is a region of endless fertility, one where every rood of ground would maintain its man. It is said, that it was the miserable policy of the Marquis de Pombal not only to keep foreigners but the Portuguese themselves ignorant of the value of this province, a policy which was realizing the character of the dog in the manger, illustrated by the fable. He did every thing in his power to degrade it, and keep it in the back ground. The situation of it is well adapted for rendering it the dépôt of an extensive and lucrative trade, but the commerce, in

consequence of such short sighted policy, is extremely small, a kind of petty retail rather than any extensive or liberal trade. A merchant is obliged to buy, from time to time, small scraps and parcels. Such, for instance, as a pound or two of isinglass, by which means he is long in accumulating a stock.

All the produce is brought to Para in canvas from a distance of six or seven hundred miles in the interior. But the whole country, as before observed, is too large for its present mode of government. When we see nations swayed by intelligent rulers, rising in greatness and importance, or when cursed with vicious and imbecile leaders sinking into contempt and misery, it is evident that,

“Of all the ills that men endure,
How small the part that kings can cure.”

The Brazilian tribes about Para appear to be a fine healthy and well-conditioned race of people; their skin is of a good firm copper colour, without a tinge of black; they have long jetty hair with a rubicund face, made up of an intelligent set of features, in which a general expression of mildness and good nature predominates. If heat had anything to do with colour, they would be black enough; for at Para, directly under the equator, and in a low level country it is intolerable. The superiority of the Brazilians over the poor African tribes of slaves at Para, is particularly remarkable, and the contrast is sadly against the latter.

It is customary for the negro slaves to come down in groups every morning to the river side to purchase various articles of produce brought down from the interior by the native canoes. On these occasions it is amusing to see the negroes up to their knees in the water with their petticoats tucked around them, the whiteness of which contrasts well with their jet black skin, their woolly hair, and their repulsive countenances, and appearing in the presence of the Brazilian boatmen a very inferior order of beings, as they really are. The precision with which they carry things on their heads, is also exceedingly amusing; but it has often been a subject of admiration in other countries. Here they may be seen with a basket of fruit, or a jar of oil, or a calabash of milk, or a jug of water, all placed on the head; in fact, whatever they may have to carry is invariably placed on their heads. At this usual morning rendezvous by the river side, some bring coffee ready made for breakfast, while others bring a favourite liquor called “wassaree” an infusion of a small kind of palm. This beverage has the colour of port wine, and when sweetened is highly esteemed by these people. In fact, with a banana, or alligator pear, it forms the principal fare of many, while others prefer the farina of the cassada with it. Cocoa is the staple article of Para, and is produced in vast quantities; but it is so depreciated in the foreign market, that it will not defray the expense of freight. There is in fact no sale for it, and the aroba, or thirty-two pounds of cocoa, when we were there, was only worth twenty-pence. Hence the cultivators of it were ruined. Rice is very abundant; but corn is scarce. Sarsaparilla,

balsam, copayva, tonquin beans, vanilla, farina, oils, and India rubber, are the chief articles of exportation. The importations are flour, spermacetti candles, soap, shoes, etc., from the United States; cotton goods and hardware from England; wines, vinegar, olive oil, limestone, drugs, chestnuts, etc., from Lisbon.

The manufactures of Para are ladies' combs, polished with the leaf of the *caratella Americana*; good leather from the skins of the *goats* or *hares* of the country; coarse and bad pottery, chocolate and coarse hammocks, cotton bags and lime grass hammocks, straw and palm hats, lace, salt fish, and jerked beef. The Indians bring down from the country elegant wands of beautiful feathers called sceptres, besides superbly ornamented hammocks, feather dresses, bows and arrows, and stained calabashes.

QUALIFICATIONS OF OFFICERS OF MERCANTILE MARINE.—*Steam.*

A SAD accident was reported a short time ago, on board the *City of Liverpool*, in the Bramley-Moore Dock, at Liverpool, by which some eight human beings were either killed or wounded. A jury of their countrymen returned the sensible verdict that they lost their lives through the culpable negligence of Messrs. —, in originally fitting the boiler, which caused the catastrophe, with inefficient safety valves.*

* "THE BOILER EXPLOSION AT LIVERPOOL.—The inquest on the bodies of the men killed by the explosion of the donkey boiler on board the ship *City of Liverpool*, was concluded at Liverpool on Friday night. The jury returned the following verdict:—Accidental death, caused by the explosion of an engine boiler on board the *City of Liverpool*, in Bramley-Moore Dock. With respect to the boiler, the jury are of opinion that the equipments thereon were bad in the extreme, and that such safety-valves ought to be at once removed from all steam boilers used in this port—at least, as unfit to be in use. After the sad occurrence which took place in Burnley from a boiler made and equipped by Messrs. Green and Son, the jury are of opinion that Messrs. Green and Son are highly censurable for sending out such boilers fitted with such dangerous equipments. The jury are also of opinion that Messrs. Marshall and M'Conochie are highly censurable for having neglected to see that both engine and boiler were in good and proper working order, after receiving instructions to do so from the captain. The jury are strongly of opinion that the use of donkey engines on board sailing ships for the purpose of loading and discharging cargoes should be strictly prohibited, for the reason that there are no competent engineers attached to such ships to undertake the management or supervision of such engines. We cannot conclude our presentment without adding our opinion that the owners of the ship are censurable for not employing a competent engineer to work the engine during the time of loading and discharging the same, and we are of opinion that the owner, and Messrs. Marshall and M'Conochie should be called upon to contribute something towards the relief of the widows and orphans of the deceased men.' The Deputy Coroner, in discharging the jury and thanking them for their services, said he was sorry that he could not indemnify them for the time they had lost and the trouble they had been put to. He had consulted all the authorities upon the subject and found he was quite helpless in the matter. It was, however, quite open to them to petition the Town Council for some compensation."

It is impossible to see the really criminal carelessness which for years has hung over our Merchant Marine, without concern and regret. Storm, fire, collisions, and steam, alike continue their fearful ravages in defiance of the efforts of legislators or the unceasing exertions of philanthropists of the age. Before the subscription list to alleviate the misery, caused by one accident, has closed, a second is appealing to our sympathies.

Doubtless many of these might be prevented by more active legislative interference, for headstrong competition induces, or drives, many an engine-maker or ship-builder to put his name on work which nothing could have induced him to do but sheer necessity. It is absurd for men to say, every one has a right to act as he pleases in such circumstances, the law of necessity is stronger than the law of safety, and induces many a seaman to jeopardize his life in a badly found ship, and many a stoker to risk his in attending an ill-found boiler. On examining the latter, in a merchant ship, it is proved to be a matter of surprise that such accidents are of rare occurrence. Faulty safety valves, rude turned bearings, working in cast iron bushes, added to the ignorance of the men in charge; all lead to the inference that but for certain fortuitous circumstances, more lives than are at present, would be sacrificed.

An ill attended or defective boiler is at all times a most dangerous subject to deal with in a ship, especially as it is usually worked at a very high pressure of steam. And surely the time has arrived when some supervision is absolutely necessary for safety of life and property. The present custom is to pick the *donkey-boiler man* by chance from among the crew or from the street. He may never have had the slightest training for such a duty, or he may be a drunkard; but in times of necessity all this is overlooked. To say that any stringent examination for the post is required would be absurd. A practical engineer could decide in five minutes whether a candidate for this duty is fit to have charge of a boiler or not, and a certificate to that effect might be given. As steady men frequently make twenty per cent. over their pay, when in charge, the post would be more sought after by such, if an official qualification were made indispensable, and the certificate would, in a certain measure, be a guarantee for good behaviour, as it may invariably be seen that all men feel a certain degree of pride in possessing any badge of office which makes them superior to their fellow men.

It is much to be desired that examinations in steam and mechanics were gradually introduced into the Merchant Service for all classes of officers and commanders. Our ships are now fitted with so many mechanical appliances that a certain amount of knowledge of the science is an absolute necessity to all men in command. As a check even on the engineers, such a knowledge would prove invaluable, for these men too often endeavour to make a mystery of their profession, and raise difficulties about repairing slight accidents to machinery, which a commander conversant with the principles would laugh at. Not long ago, it came to my knowledge that a large steam ship was

detained six weeks, with a cargo of great value on board for the Pacific ports, in consequence of a break down in one of the air pumps of the engine. The clever city engineer had told the captain that it would be impossible to repair the accident with their own resources, and informed his messmates subsequently, that he was *paid by the month, not by the voyage*. At the termination of the six weeks the captain brought an engineer on board, who had the ship ready for sea in twenty-four hours. Hence it is evident that if the captain had possessed an ordinary knowledge of machinery, he would not have allowed a rascal to impose on him, and to entail an enormous loss on the owners of ship and cargo. It is well known that the vessel was especially chartered in order that the goods might arrive at their destination in time to meet the demands of an annual fair; of course when she did arrive, the fair was over, and the goods were comparatively valueless.

A late police report said, that a steamer had been compelled to put back owing to the drunkenness of the chief and second engineers. The first had one of his fingers crushed when he was drunk, and could not attend the court. From the evidence it would appear that the law is so defective that the magistrate could not suspend the certificate of the second engineer, although the charge was proved. He was therefore dismissed with a caution, and a second opportunity was thus given him of trying to blow Her Majesty's subjects and their property into the air. What Sydney Smith foretold about a bishop being burnt in a railway carriage, will come to pass: when the Board of Trade is blown up, in a steamer, by the drunkenness of an engineer, we shall have some wiser and more stringent regulations.

MERCATOR.

— —

CONSIDERATIONS of the winds, currents, and tides of the Gulf of Cadiz, and the Western Shore of the Spanish Peninsula, with the best points for making the coast from sea, and how it should be navigated.

(Continued from page 539.)

Land and Sea-Breezes.—These partial winds proceeding from the same causes as those which give rise to the Trade winds, are common during summer in the Bay of Cadiz. The sea-breeze, as in tropical countries, is found on the coast at Cadiz in summer when the East wind does not prevail, and are strong and lasting in the Gulf of Huelva.

Sea-breeze on the Coast of Cadiz.—From nine to ten o'clock in the morning the sea-breeze sets in gradually and veers to S.S.W. and S.W., as the sun gains height, attaining its greatest strength when the sun has passed the meridian, or at the hottest time of the day, and gradually subsides as the sun loses height, veering westerly until eight or nine o'clock in the evening when it falls calm. After two or three

hours of calm the land-wind gets up, acquiring more strength in proportion as the coolness of the night increases. At daylight it has attained its utmost strength, and fails gradually as soon as the sun appears and begins to warm up the ground again to receive in its turn the cool sea-breeze.

In the Gulf of Huelva this land-breeze is from N.E., and E.N.E. in the Bay of Cadiz; while on the African Coast it becomes E.S.E. When the land-breeze blows from the east in Cadiz Bay it shows that the *Levanter* is blowing in the Strait of Gibraltar.

Sea-breezes in the Gulf of Huelva.—These sea-breezes in the Gulf of Huelva begin at S.E. and leave off at N.W. In summer time they are almost constant, and while they last a vessel will be safe off the coast, even to anchoring to obtain water, or to rest from a cruise. Off the Cadiz coast the sea-breeze is not so strong, for it is subject to interruptions from the Easterly wind, which is not so frequent in the Gulf, inasmuch as that noxious wind does not reach so far.

Although the sea and land-breezes belong to summer, they also come in winter attended with long intervals of fine weather.

Let us now turn our attention to the winds of the coast of Portugal and Galicia.

Winds on the Western Coast of the Peninsula.—The prevalence of polar and tropical winds on the western shore of the Iberian Peninsula may be considered as constant, since those from N.W. and S.W. are but inflections from them, and those from N.E. and S.E. may be considered as land winds or from the opposite quarter.

The South coast of Portugal which forms a portion of the Gulf of Cadiz is thoroughly persecuted by winds from the S.E. and S.W. quarters, and the dividing limit between the winds from these two quarters may be considered as Cape St. Vincent; so that a vessel doubling this Cape from one side or the other finds shelter from S.W. or S.E.

In like manner, for a third-part of the year, Northerly winds are found to prevail, the wind varying between N.E. and N.W. fresh with clear weather during the summer, and cloudy or showery during the winter.

From April to October the Northerly winds mostly prevail, Southerly winds blowing during the other months, that is, S.W. winds prevail from November to March, and which generally leave off at N.W. When in the fine season the *Vendaval* prevails it is moderate and seldom lasting.

Southerly and S.S.E. winds frequent from December to March, scarcely blow for twenty-four hours, for they will be light with rain about a day, and then jump to S.W. where they remain longer, and leave off at West or W.N.W. which serve for either tack.

Winds of Winter.—The bad weather season begins on this coast in November and ends in February. During these winter months those heavy rains take place, which come with S.W. and N.W. gales. The *Vendaval*, which is the byword among the seamen of these shores to distinguish the severe weather from S.S.W. to W.S.W., brings up

heavy clouds from the southward, preceded by a light mist which flies with more or less swiftness according to the strength of the wind which may be expected.

Signs of the Vendaval.—When the sky is clear, and small clouds appear which are very high and scattered, and embellish the firmament (cirro cumulus), to which navigators give the name of cielo aborrigado (mottled sky), the *Vendaval* may be expected especially in winter, as a day cannot pass without the sky being completely overcast, and the wind is settled at south. If the *Vendaval* is strong it will bring abundance of rain in the first twenty-four hours and will next change to the S.W. where it will continue for two or three days, then veering to West, and perhaps to N.W., always blowing hard, perhaps with less rain.

The appearance in the rigging of those threads called telaranas, to which we have alluded, is also a sign of the *Vendaval*. These however are mostly limited to very fine clear weather when all is calm and quiet. When this sign appears in winter a Southerly wind may be expected, which will soon freshen to a gale with rain. In summer this sign is preceded by cloudy weather and winds from the S.W. and N.W. quarters, which are those that supply rain.

Some years there are when during the whole of the winter the S.W. and N.W. winds set in more or less strong, but always accompanied by showers, the interval of clear weather between them being brief, and in which intervals the wind will shift from N.W. to North and N.E., at these points it will remain, and bring fine weather until it returns to S.W.

Backing of the Vendaval.—When the *Vendaval* drops to a calm, and showers cease without any wind from the N.E., the S.W. wind may again be expected with a return of bad weather, far worse than the former. But in order to have any confidence in the weather, the *Vendaval* must take its normal course, that it should terminate at N.W., and that from thence the wind should change to N.N.E. or N.E., when it would be settled for several days.

The North-easters in winter are also attended with an overcast sky and occasionally showers accompanied with snow or hail, but in general they bring clear weather. In summer when they blow hard they are accompanied by a mist so that the coast cannot be seen from twelve to fifteen miles off.

When about the end of winter the ground is saturated with wet, this will prevent the *Vendaval* from reaching the coast, and vessels which may be running from bad weather at sea to some inlet, find the wind will change to the South and S.E. on nearing the coast and thus retarding their approach to it. S.E. winds however are rare, and when they blow in winter they are attended by heavy snow showers and are very strong. The Easterly wind is always the coldest.

The Northerly winds, properly so called, vary between N.N.E. and N.N.W., and mostly are found on the west shore of the Peninsula, they prevail from May to September, interrupted with light *Vendavals*, and almost always are attended with clear skies.

The *Vendavals* of this season which are almost always of brief duration, generally bring cloudy weather, which does not clear away until the wind veers to N.W. on its way to North. In proportion to the density of the clouds which the *Vendaval* brings, the less most probably will be the duration of the wind. Notwithstanding the prevalence mostly of Northerly winds in summer on this coast, it is also very liable, and especially that of Galicia, to waterspouts and showers, the effects of opposing winds.

Waterspouts.—These phenomena will form with an Easterly wind or perhaps some off-shore wind, at the time when the wind at sea is from S.W., and as the clouds which this wind accumulates over the coast are driven back by the off-shore wind a waterspout is formed.

Sometimes the waterspout is formed instantaneously, accompanied by heavy thunder and rain, for which it is necessary to be prepared by shortening all sail, for they usually are attended with much wind. These opposing winds occur in August and September, principally in summer when there is much heat.

As there are years with hot seasons on the coast of Cadiz and the Strait of Gibraltar from the *Levanter*s, so also are there others of cold seasons from Northerly winds on the coast of Portugal. Nevertheless in these same years there are many marked changes, which prove how difficult it is to determine the limits of the changeable wind on any particular coast.

The following table formed from meteorological observations made at Lisbon will give a good idea of the winds which have prevailed there for two consecutive years.

Statement of the prevailing winds at the mouth of the river Tagus from the first of October, 1863, to the end of September, 1865, with the heights of the barometer and thermometer corresponding to the wind.

Winds.	No. of Days it lasted.	Barometer		Thermometer		Observations and Remarks.
		Max.	Min.	Max.	Min.	
Calm ..	10	..	..	..	..	They are generally clear and fresh during all the year, especially from May to September.
North ..	128	774.2	753.6	24.6	2.2	
N.N.E. ..	96	773.8	753.3	27.5	4.2	
N.E. ..	110	775.0	751.7	29.1	2.3	
E.N.E. ...	28	768.2	759.5	29.9	2.0	
East	38	772.1	750.4	27.1	4.4	They are fresh and attended with rain or snow from October to April, especially with winds from S.S.E. to W.S.W. Fogs are frequent from October to February and generally with S.E. to S.W. winds.
E.S.E. ..	18	768.5	756.3	23.3	10.2	
S.E.	9	765.6	745.7	19.8	10.1	
S.S.E. ..	2	768.6	764.6	19.2	8.2	
South ..	28	764.4	752.2	24.8	9.5	
S.S.W. ...	45	768.4	745.2	21.6	9.1	
S.W. ..	50	773.2	741.1	20.0	8.9	
W.S.W. ..	25	767.7	744.2	22.6	8.9	
West ..	26	768.6	755.3	25.7	6.2	They are fresh with snow showers and often in summer. In win-
W.N.W. ..	13	763.5	744.0	21.7	10.2	
N.W. ..	49	773.6	756.3	26.0	2.0	
N.N.W. ..	56	773.6	756.9	26.0	2.0	

The foregoing may be resolved into the following table—

Months of Observation.	Winds of N.E. Quarter.	Winds of S.E. Quarter.	Winds of S.W. Quarter.	Winds of N.W. Quarter.
	Days	Days	Days	Days.
1863, October	12	5	8	5
November	24	5	0	1
December	26	0	2	2
1864, January	19	7	2	3
February	12	0	11	5
March	13	3	11	2
April	12	3	6	6
May	14	5	8	6
June	15	4	3	8
July	14	5	3	9
August	18	2	5	6
September	19	6	2	3
October	8	3	17	4
November	13	3	6	8
December	5	2	4	10
1865, January	6	2	15	8
February	15	2	3	8
March	20	0	4	7
April	9	4	10	7
May	15	2	9	5
June	14	4	5	6
July	20	0	1	10
August	14	0	6	11
September	17	0	7	5
In the Two Years ..	363	67	148	144

From the foregoing we may conclude that winds from the Northward, or those from between N.W. and N.E., both inclusive, have prevailed for 439 days

From South or between S.E. and S.W. .. 134 "

From East or between E.N.E. and E.S.E. .. 84 "

From West or between W.N.W. and W.S.W. 64 "

So that the prevailing winds for the period of two years were from the North, with a remarkable preponderance over the rest, and they were the most lasting in the months from May to September.

It must be noted that the observations were made at nine a.m., a time when perhaps the wind for the day is not established according to that outside, especially in winter; and that the place of observation was the observatory, which besides being well up the river Tagus (or rather the Lisbon estuary) is subject to the prevalence of the land

wind which commences at the lower part of the Tagus. Observations carefully made at the lighthouse on the Berlings will give us hereafter a better idea of the winds which prevail on the western coast of the Peninsula. Nevertheless we may be satisfied from the above results that the prevailing winds on the coast of Portugal are Northerly, those of the opposite quarter prevailing from October to April, and which alternate with those from West and N.W.

CURRENTS.

Currents are the manifestations of that great system of circulation in the waters of the ocean, arising from the same causes which produce those of the atmosphere, viz., heat and cold; and it may be said that there is a complete similarity between the movements of each, differing only in velocity in consequence of the great difference in the densities of the two fluids.

Besides this cause there are others perhaps as powerful; not only in promoting them, but in contributing to their strength; also proceeding from the same origin of heat and cold. Such are the various degrees of pressure of the atmosphere on the surface of the sea and the impulsive power of the winds.

All these agents combined, keep the waters of the ocean perpetually moving; forcing them to pass to and fro between the equatorial and Polar regions. So that from whatever part of the ocean a current may run, another of the same extent and force is set in motion in an opposite direction, thus always preserving a due equilibrium.

Diversity in Currents. The great masses of water in its motion from south to north and north to south (setting aside the disturbing effect of the diurnal motion of the earth), rush along the coasts of the great continents, islands, and gulfs in their irregular distribution on the surface of our planet and in encountering these obstacles alter their course, become divided, run counter to each other, taking different directions and forming the eddies and ripples which we so often meet with. Such perturbations are also common to the currents of the atmosphere, the effect of which we find sometimes to our cost.

At sea, by means of our reckonings and accurate observations, we can detect the set and velocity of the currents, which on the coasts are still more readily detected, being familiar to coasting vessels, and even to fishermen of the deep sea who experience them with the nets which they use from their boats, as they watch over their stone moorings.

Doubtless the current is one of the most formidable enemies which the sailor has to deal with: for besides being imperceptible, it is also variable, and as yet no means have been invented of immediately knowing its strength and direction with that facility which we have of seeing the progress and course of the ship. Hence the necessity of collecting all the information we possess of the currents on every coast, bay, or channel, and describing them for the mariner, in order that he may provide against his insidious and dangerous enemy.

Yet the subject is one of difficulty, and it is only with time and

observation, we can arrive at general conclusions as to their force and direction in any particular locality; for they never are the subjects of continual observation, as is the case with meteors, for which a multitude of instruments have been invented, and observatories specially established for them, while collecting the secondary notes of navigators and fishermen is the imperfect mode of obtaining an *approximate* idea of these.

Currents of the Bay of Cadiz. Confining ourselves here to Cadiz Bay, we might observe that there is a general current running from south to north and from north to south, inclining to either quarter according to the direction of the wind that is blowing, or that which is about to blow; for sometimes the current runs in anticipation of the wind which will afterwards add to its strength, and the navigator satisfies himself of the quarter from whence the wind will come by the direction of the current.

It is only in the immediate neighbourhood of the mouth of the Strait of Gibraltar and within it, that a constant current is observed, setting to the eastward, occasioned by a small difference of level supposed to exist between the ocean and the Mediterranean, in consequence of the expenditure of water in that inland sea from an excess of evaporation beyond precipitation; a loss which the Atlantic re-supplies.

Rennell's Current. An English officer, Major Rennell, in reference to the above current considers, that in the space between the parallels of 30° and 45° N. and to the east of the meridian of 14° W. longitude, there is a tendency of the waters of the Atlantic to set towards the Mediterranean at a rate varying between twelve and twenty miles in the twenty-four hours. We think this is a bold decision and somewhat of an exaggeration.

If with the above data we reduce to figures the surface of the ocean in question, we shall find it represents forty-two thousand square leagues, and however superficial we may allow the stream of this extensive surface to be, as it runs towards the Strait on reaching its mouth, so large a volume would be collected that it would not be sufficiently large to receive it, and the result would be that the neighbouring shores would be inundated, and the strength of the Strait current would be more than we could calculate.

Current of the Strait of Gibraltar. That there is a perpetual current in the Strait of Gibraltar is no doubt a fact proved by every-day's experience; but sometimes even this current is quite insignificant, it is only felt at its edges, and a few leagues to the west of the entrance it is scarcely perceptible.

Every-day's experience, and history itself, informs us that this current is of no great dimensions. The ships which suffered by loss of masts and sails after the battle of Trafalgar, far from being swept into the Mediterranean by this supposed current drifted to the coast of Cadiz and the Gulf of Huelva, and the pilot of the *saluca Real Carlos*, burnt within the Strait in the year 1801, reports his being thrown on Tangier Beach instead of having been carried away by that

current.* Nor do we remember any bottles thrown overboard for the purpose of detecting currents being found on its shores.

The difference of level between the two seas is not so much as would occasion any extraordinary current; and it might altogether have escaped observation if the constantly easterly set had not suggested it. Vessels that have been perpetually cruising off Cadiz and its vicinity on many occasions have never troubled themselves about the easterly current, for it has never affected them, and they have been concerned only about being set into the Strait, when becalmed in the mouth of it.

Counter Currents in the Strait of Gibraltar. There is however a periodical difference of level which passes unperceived although of importance, sometimes between the waters to the westward of the Strait and those not very far off to the eastward. This difference of level, about 3·3 m. ten feet occasionally, and which is the effect of the tides, nevertheless does not contribute in any way to increase the easterly current into the Mediterranean.

It is very well known that in this sea there are scarcely any tides, excepting in some places, one of which is at the Strait itself communicating with the two seas. From Malaga to the eastward where the tides go on decreasing, and become so imperceptible that on the meridian of Cape de Gata all trait of this great phenomenon is gone, while on that of Cadiz which passes not very far from the mouth of the Strait spring tides rise 3·3 m. ten feet. And notwithstanding this difference of level of ten feet in a distance of two hundred miles, far from increasing the easterly current, this is diminished by it during the flood tide.

When the tidal wave of flood passes in its course from south to north along the African coast, the Gulf of Cadiz and the coast of Portugal, it does not penetrate (as one would at first suppose) into the Mediterranean, increasing the strength of the general current; but draws along with it its waters, which in obedience to lunar action rise in the Strait and mingle with the great tidal wave to pursue with it its ocean course. Consequently, during the flood, the waters of the Mediterranean as far as a certain limit which is known as not beyond the limit of Almeria, commence moving to the westward on the coasts. This movement is the more perceptible as the mouth of the Strait is approached, so that at the points of Europa and Almeria the tidal current to the westward interferes with the eastern current of the

* This accident occurred within the Strait in the night of the 12th of July. The *Real Carlos*, supposing that she was engaging one of the enemy's vessels that were hovering about the rear of the French and Spanish squadron on its way from Algeciras to Cadiz, attacked her companion the *Real Hermenegildo*. Unfortunately the mistake was not discovered until they mutually closed to decide the action, and both were burnt; nearly all the crew of both being lost. Forty men were saved by a boat and six or seven in the fishing boat belonging to the crew of the *Carlos*, picking up also the second in command of the *Hermenegildo* from the water. The pilot above mentioned was also saved.—*La Marina por Traveso*, vol. 8, Madrid.

Strait, in the middle of the Strait reducing its strength, and narrowing its limits.

When the ebb is established, the waters of the Strait return to join those of the Mediterranean, and yet a large amount of them joins the ocean tidal wave on its way to the South; the rest running through the Strait to the eastward, and even perhaps, with more strength than they had on the flood.

It is when these currents are running within the Strait, that the most considerable deviations and counter currents are produced; of which a good idea is given in the general directions for the Mediterranean, and it is by availing themselves of them that the coasting vessels pass through the Strait against westerly winds; and when once clear of its western entrance they need no longer trouble themselves about any current which may take the direction of the Strait, for they get to windward without any difficulty.

The wrecks of vessels on the coasts of Cadiz and Huelva, as well as those on the African coast, quoted by Major Rennell, are occasioned by the current from S.W. to N.W. principally. These may be considered as inflections of the general current from south to north and north to south, in the same way as we may recognize the S.W. and N.W. winds as inflections from the south and north.

Polar and Equatorial Currents. When the ocean waters run from south to north, by this movement they most likely reduce the atmospheric pressure experienced then in the polar regions, originated by the intertropical winds. The S.W. wind with its impulsive force would naturally affect the direction of the current setting northward and compel it to run to the N.E. and drifting vessels over to the African and European shores. Then an atmospheric re-action takes place that acquires a very low temperature in the northern latitudes and exerts a considerable pressure on the surface of the sea, compelling its waters to flow towards temperate regions where there is also going forward a constant displacement arising from evaporation. By this new change of place the current from north to south is formed, impelled by the N.W. wind which is an inflection of that from the north, and it consequently assumes a S.E. direction, which also throws vessels on the coasts above mentioned.

In the perpetual transfer of the waters as thus stated, the different currents take place as we find them on the coasts, assuming that direction which their bays, islets, and channels impart to them.

In the open sea doubtless the winds play a random game in directing the currents. When after a calm any particular wind sets in, the surface waters make a slight wave carrying them gradually to leeward, their magnitude being proportioned to its strength until waves of a considerable size are formed, which agitate the ocean to great depths; and seamen know pretty well the force of these huge masses of water, which sometimes may be a hundred feet in depth.

Perpetual Currents. Certain it is that there are currents following constantly the same direction, that will be running against the prevailing wind, like those of the Bosphorus, the Strait of Gibraltar,

the Florida Channel, etc. But these are but the results of physical causes and peculiarities affected by the form of the seas or gulf adjacent to the Atlantic.

The ocean current scarcely ever changes its direction so readily as that of the atmosphere, as one should expect from the difference in density of the two fluids; but the equilibrium of the waters being once re-established, they obey the impulse of any agitating cause.

It is often observed that before a wind comes home upon a coast, the waters are moving in the same direction as if they were driven by it, and the navigator finds this out before the wind has come.* It is then that the current is the prelude to the wind which is coming in the same way as the swell indicates the wind which produces it; and should this not have arrived at the place of observation it is no reason that it should not be found in another locality perhaps not very far away.

Currents from the Southward. When the S.W. wind prevails in the Atlantic in the vicinity of the Strait, which wind expands the atmosphere, the level of its surface is raised, and that of the Mediterranean not being raised by the same cause, the difference of level becomes greater and the easterly current stronger. But both levels obeying equal pressure from their contiguity it may be said the difference of level is constant. However a stronger easterly current is always found when the wind is blowing hard from the westward and this has its explanation.

Always when these winds are general in the Mediterranean the waters accumulate in its interior and in some places attain an extraordinary elevation.† This accumulation towards the interior naturally occasions a deficiency at its western end which the Atlantic has to make up. But the wind ceases and takes the opposite direction and also the waters, causing a lower level in both seas and even a temporary paralysing of the easterly current. It is well known that occasionally the current through the Strait from the Atlantic is N.E., and that this will occur when a strong *Levanter* is blowing in the Mediterranean that produces a transfer of the waters contrary to that which we have pointed out.

During the hard *Vendavals* a strong current runs from south to north in the Gulf of Cadiz, that assumes the direction of the coast off which it runs. On the African coast it takes a N.E. direction, north and N.N.W. on the coast of Cadiz, a small portion penetrating the Strait and the rest running N.W. and west by the Gulf of Huelva and the Algarve coast; passing Cape St. Vincent it joins the general current. In the middle of the gulf its direction is N.E.

After this mass of water which comes from the intertropical regions

* There was a remarkable instance of this in the China Sea, in the loss of H.M.S. *Reynard*, in 1851, Commander P. Cracroft. A current had been setting this ship for a whole day in a calm towards the Paracels in the China Sea, a heavy gale following it the day after, which was the occasion of her loss.—Ed.

† Vice Admiral W. H. Smyth quotes elevations of twelve English feet on the coast of Tuscany with strong *labeeches*.

has made this passage within the Gulf of Cadiz, it mingles with the larger mass passing outside and both run along the coast of Portugal and Galicia, following its sinuosities, then passing Capes Finisterre and Prior, run along the Bay of Biscay and enter the English and St. George's Channels, to expend itself in the northern seas. It is certain that with the above mentioned winds, strong currents are experienced in those channels, and in the estuaries and ports of their coasts, there are astonishing accumulations of water.

The current of which we are speaking affords us good evidence of its efforts by the great rise above the ordinary level of the sea in the Gulf of Cadiz; for in its bays, ports, and estuaries, it exceeds by two and three feet the usual rise, and makes the establishment, or hour of high water later. This extraordinary rise of itself reveals a current. Still this accumulation in the Gulf has its limit, and the waters which it cannot contain, repelled by the coast of Cadiz, escape to the westward to mingle with the current running northward.

Losses occasioned by this Current. To the effects of this current may be attributed the wrecks above mentioned, of the dismasted ships after the battle of Trafalgar which was followed by a *Vendaval*; and also of many ships which consider themselves to be running safely along the Spanish coast for the Strait of Gibraltar, terminating their career on the reefs of Conil and Santipettri, and others, especially before the lighting of the coast was general.

We may also cite the case of a Spanish merchant ship, which, considering herself certain of making Cape Spartel at daylight, and confident of her reckoning, found herself nearly in the midst of the breakers of Santipettri, and owed her safety to the weather enabling her to double Cape Trafalgar and to make for the Strait.

Vessels from the Strait of Gibraltar making for Cape St. Vincent with southerly winds, frequently find themselves too near the shore in the Gulf of Huelva, a condition which frequently happens with coasting steamers, and they find from experience, that with those winds they have to give the shore a good berth, on their way from Cadiz for the Strait, or for the above Cape. In this last passage, if they do not take the necessary precautions they find themselves hampered with Cape St. Mary, and in general overrun Cape St. Mary owing to the current setting then to the westward.

Vessels obliged to wait off Cadiz in a hard *Vendaval*, whether cruising or for any other reason, must not depend too much for their position on the reckoning; for they will always find themselves set into the Gulf of Huelva, and will become entangled with the Arenas Gordas when they are considered to be on the meridian of Cadiz. In such cases it is necessary to carry all the sail they can to keep to windward, and compensate for the current, and more readily to gain the parallel of the Strait.

Strength of the Current in Cadiz Bay. It is difficult precisely to define the strength of the current in Cadiz Bay in a strong *Vendaval*; but we consider ourselves as by no means exaggerating when we give it a maximum of two miles an hour between Capes Trafalgar and

St. Vincent in a N.E. and northerly direction in the middle of the Bay, and in a N.W. direction in the vicinity of the coast. This being the case it is always better to avoid lying by the wind too long in a *Vendaval* between Capes Trafalgar and Santa Maria, it being far better to get into Cadiz if possible, or keep in the mouth of the Strait to run in it if it should be convenient.

In the usual weather when the land and sea-breezes alternate with easterly and westerly winds the currents are not strong in Cadiz Bay. With established easterly winds the tendency of the waters is from east to west, and the reverse with westerly winds excepting in the western mouth of the Strait, where the current is always easterly. On the coast no other current is known than that of the tide, and this is more or less strong and of greater or less extent off shore, according to the age of the moon.

Northerly Currents. After several days of hard southerly winds, those from the opposite quarter get up; the ocean waters experience the same reaction; and although the current does not so readily change its direction as the wind does, it nevertheless soon stops and follows it, to make good the equilibrium in the equatorial regions by obeying the impulse of the N.W. wind.

On the northerly wind establishing itself after the southerly wind has ceased, it brings with it the cold atmosphere belonging to it; and in consequence a greater atmospheric pressure on the surface takes place. The waters coming from the northern seas naturally seek their way to the southward; and as the current thus formed by the aggregate force of the wind from the Polar regions, a current from north to south is produced with the same strength as we have already mentioned.

If the wind has a tendency to come from the N.E., the pressure of the atmosphere will be greater and the surface will have a considerable depression of level, probably as much as it acquires in elevation with the opposite wind.

The current which ebbs then from the English and St. George's Channels, combines with the general current, and that from the Bay of Biscay (where the depression produces a remarkable difference of level), running together in the offing of the coast of Portugal, a portion entering the Gulf of Cadiz through which it flows, and taking its course afterwards along the African coast.

In the Gulf of Cadiz with this current there is no risk whatever, for it rather sets vessels from the coast and is never so strong as the current of the south. It is observed if a considerable lowering of the level of the sea takes place in the bays and harbours, that high water does not rise to its usual height and the tidal hour is earlier.

If the wind should have a tendency to the N.W. there is also a depression of the waters from north to south, but not so considerable. With this wind, very strong sometimes, the waters are transferred to the S.E., a portion of them passing into the Bay of Biscay, where indeed they accumulate, producing an easterly current along the shore, and making it southerly along the Portuguese coast.

It may be concluded that the N.W. wind falling obliquely on the general current from north to south it compels this to take a S.E. direction. When this current falls on the Spanish shore its N.W. front is divided, the coast obliging it to take two directions, one part running to the eastward along the shores of Cantabria and the other to the south along those of Galicia and Portugal.

SIKYANA OR STEWART'S ISLANDS, AND THE SEA-SLUG.

A CORRESPONDENT seemed to be at a loss in our last number for the position of the Stewart's Islands, and imagined he had made a discovery. We here add the account which Captain Cheyne gives of them who passed some months on them, collecting the biche de mer or sea-slug, an account of which he also adds—

Stewart's Islands consist of five low coral islands, covered with cocoa-nut trees, and connected by coral reefs, forming a lagoon inside. The group is of a triangular form, fifteen miles in circumference, and visible from a ship's deck twelve miles. The easternmost and largest island is about a mile in length. It is situated in lat. $8^{\circ} 24' 24''$ S., long. $163^{\circ} 0'$ E. This position will be found nearly correct; ships bound to China or Manila from New South Wales, would have an excellent opportunity of testing their chronometers by sighting this group as it lies directly in their track. The reef is steep too and may be approached to within a cable's length all round.

This little group is inhabited by a very hospitable and inoffensive race; who are of a light copper complexion. The population in September, 1847, consisted only of forty-eight men, seventy-three women, and fifty children, in all one hundred and seventy-one souls. They are without exception the best disposed natives I have met with among the islands. I resided on this group for nine months in 1847, collecting biche de mer; during which time they treated me with the greatest kindness and hospitality. Although I was completely in their power, yet I found them strictly honest; and they were so willing to work for me, that they continued to collect and cure biche de mer, day and night, until they had picked up all that the reefs produced*. The lagoon is well stocked with many varieties of fine fish, which they catch in various modes; but chiefly with nets, on the shallow part of the reefs, at low water. They live principally on cocoa-nuts and fish, and appear to enjoy excellent health.

Pigs weighing 100 lbs., can be purchased for five pounds of tobacco, or ten yards of strong unbleached American drill, or calico. They will also take shirts, trousers, blankets, knives, saws, chisels, tomahawks,

* An American brig procured 250 piculs (equal to $133\frac{1}{2}$ lbs.) of biche de mer at this group, in 1845; and I collected 265 piculs during my stay on the islands, in 1847, all of the first quality.

or small hatchets, fish-hooks, small boxes with locks and hinges, etc., in exchange for their island commodities. Strangers touching here, may allow them to come on board with perfect safety, as they are quite harmless.

They can nearly all speak more or less broken English, which they have picked up through their intercourse with whale ships, who often visit them to get supplies of cocoa-nuts and pigs, of which a plentiful supply can be at all times procured.

The little village where they reside, is situated on the lagoon side of the easternmost island. The other islands are uninhabited; and are merely visited occasionally by the natives when out fishing at night. A ship in want of refreshments, should stand close in to the large island, and hoist a flag at the main; when they will soon come off.

As my chief object in visiting the different islands in the Western Pacific, was for the purpose of forming establishments for collecting and curing biche de mer for the China market; I shall now give a description of the different species of biche de mer, together with remarks on collecting and curing it; being the result of five years' experience in that particular branch of trade:—

There are many kinds of biche de mer (a species of fish of the genus *Holothurin*) found on coral reefs in the Pacific Ocean; but only ten of these are marketable in China; each being distinguished by well known names. As they vary in price from six to thirty-five Spanish dollars per picul (133½ lbs.), it becomes a matter of great importance to obtain the superior qualities. The slug when cured presents quite a different appearance to what it does when caught; and no person, but one well acquainted with the trade, would be able to ascertain which were the first quality, by comparing the raw slug with a cured one. Again, the success of a voyage depends greatly on the knowledge possessed by the person in charge, of the localities in which the superior sorts are to be found, together with much experience in the mode of fishing, and curing them.

The superior qualities are known by the names in the Sooloo and Manila markets:—I. Bangkolungan; II. Keeskeesan; III. Talepan; IV. Munang: each presenting a different appearance, and found in different depths of water on the reefs. Bangkolungan, when caught is from eleven to fifteen inches in length; of an oval shape, brown on the back, and the belly white and crusted with lime, with a row of teats on each side the belly. It is hard, rigid, and scarcely possesses any power of locomotion. It has, however, the power of expanding, and contracting itself at pleasure. This quality is found on the inner edge of coral reefs, in from two to ten fathoms water, and on a bottom of coral and sand. It can only be procured by diving.

Keeskeesan, is from six to twelve inches in length, of an oval shape, quite black, and smooth on the back, with a greyish belly, and *one* row of teats on each side. When contracted, it is similar in shape to a land tortoise. This quality is found in shallow water, on the top of coral reefs, and on a bottom of coral and sand. Bankolungan and Keeskeesan fetch about the same price; and the latter being the most

plentiful and easiest caught, ought of course to be the kind most sought after.

Talepan, varies in length from nine inches to two feet, and presents the most remarkable appearance of any of the species of *biche de mer*. It is found on all parts of the reefs, but chiefly in from two to three fathoms water. It is of a dark red colour, and narrower in proportion than the before-mentioned kinds. The whole back is covered with large red prickles, which render it easily distinguishable from any of the other kinds. It is much softer than the black, and more difficult to cure.

Munang, is of a small size, seldom exceeding eight inches in length, of an oval shape, quite black, and smooth; has no teats or other excrescences, and is found in shallow water on the coral flats, and often among turtle grass near the shore. This is the kind which the American vessels chiefly procure at the Feejee Islands. It is worth from fifteen to twenty-five dollars per picul in the China market.

These four varieties form the superior qualities of the slug; and the following are the middling and inferior sorts;—V. *Sapatos China*, is of a reddish brown colour, and about the same size as the Munang. It presents a wrinkled surface, and is found adhering to the coral rocks on the top of the reefs. VI. *Lowlowan*, is of various lengths, black, wrinkled, and narrow. It is found on various parts of the reefs. VII. *Balati blanco*, is about nine inches in length, of an oval shape, and a white and orange colour; and may be easily known by its voiding a white adhesive substance, which adheres to the fingers when handled. It is found generally on the inner edge of reefs, and on a sandy bottom. Moonlight nights are the best time for collecting this sort, as they generally bury themselves in the sand during the day. VIII. *Matan* is of the same species and habits as VII. and only differs from it in colour, which is grey, brown and white speckled. IX. *Hangenan*, is generally about a foot in length; of a grey or greenish colour, wrinkled; and is found on the lagoon side of coral reefs. X. *Sapatos grande*, is about twelve or fifteen inches in length, and of a brown and white colour, wrinkled, and very inferior.

The following remarks on boiling *biche de mer*, are the result of a number of experiments made by me at different times:—*Bangkolongan* and *Keeskeesan* will require to be boiled about five minutes, or more, if the pot is nearly full; they require to be well stirred; and should be taken out when thoroughly heated through, by which time they will feel quite hard and elastic. The cut part of the fish, when properly boiled, should be of a blue and amber colour; and feel firm like Indian rubber. If the pot is only half full, they will require to boil fully ten minutes, before the cut part becomes of the blue and amber colour. The Talepan and Munang require to be boiled fully ten minutes. The Munang dries very quickly; but the Talepan is very difficult to cure, and often requires two boilings before it will dry. The *Sapatos China* requires to be boiled about fifteen minutes; if properly boiled, it will dry very quickly. *Balati Blanco* and *Matan* require very little boiling, say three or four minutes if the pot is nearly

full. They should be taken out as soon as they shrink and are thoroughly heated through. The Hanganan will require to be boiled about twenty minutes. This sort must be very carefully handled when raw, as it will break in pieces if held any time in the hand. It appears to me that there are two ways of boiling biche de mer equally good. The first is to take them out when boiled about a minute, or as soon as they shrink and feel hard; the other method is to boil them as before stated; but in boiling either way, the fish ought, if properly cooked, to dry, like a boiled egg, immediately on being taken out of the pot. If curing a large quantity at a time, I should prefer boiling them slightly at first; and when half dry, I would reboil them. This method I have tried, and find it makes the biche de mer look much better, and less wrinkled when dry. Although they require a little more time in drying, if reboiled, yet I am convinced they would sell better. Biche de mer dried in the sun fetches a higher price than those dried over a wood fire; but this method would not answer in curing a ship's cargo, as they require fully twenty days to dry; whereas by smoking them they are well cured in four days.

Much skill is required in drying biche de mer, as well as in boiling it, as too much heat will cause it to blister, and get porous like sponge; whereas too little heat again, will make it spoil, and get putrid within twenty-four hours after being boiled. There is, likewise, great care and method required in conducting the gutting; for if this be not properly attended to, by keeping the fish in salt water, and from exposure to the sun, it will, when raw, soon subside into a blubbery mass, and become putrid in a few hours after being caught.

A vessel fitting out for a biche de mer voyage, should be well manned and armed; and have good strong boarding nettings; with waterproof arm-chests for the tops, sufficiently large to hold a dozen muskets each. She will require to have a number of large pots or boilers on board, similar to whalers try pots; and skimmers, ladles, fire-rakes, shovels, buckets, tubs, cross-cut saws, and axes; and, if procurable, a quantity of bricks to place the pots on, as the stones found on the coral islands will not stand the fire.

The first thing to be done on arrival at an island where the slug is plentiful, is, to erect a large curing-house on shore, about ninety feet in length, thirty feet in breadth, and the sides about ten feet in height. These houses are generally built of island materials; and thatched with mats, made by the natives, of cocoa-nut leaves; the thatch must be well put on, so as to prevent the rain from penetrating. The sides are likewise covered in with these mats, and a small door should be left in each end. Platforms, or *batters*, for drying the slug on, are then erected along one side of the house. They should run the whole length and be about eight feet in breadth; the lower one about breast high from the ground, and the upper, three feet above that. The frames are generally made of cocoa-nut trees, and pandanus; and covered with two or three layers of split bamboo, or reeds, seized close, so as to form a sort of net-work for the fish to lie on. Much care and skill is required in the construction of these *batters*, or platforms, so as to prevent the

biche de mer from burning, which it would be liable to, were they not properly fitted. A trench, about six feet in breadth and two in depth, is then dug the whole length of the *batters* for the fires. Tubs are placed at short distances along the side of the trench, filled with salt water, and a good supply of buckets kept in readiness, to prevent the fires from blazing up and burning the fish, or platforms, as well as to regulate the degree of heat necessary for drying the slug.

The process of curing is this:—The biche de mer is first gutted, then boiled in those large pots; and, after being well washed in fresh water, carried into the curing-house, in small tubs, or baskets, and emptied on the lower *batter*, where it is spread out (about five inches thick) to dry. The trench is then filled with firewood, and when the *batter* is full of fish, the fires are lighted, and the drying process commences. From this time the fires must be kept constantly going, day and night, with a careful officer and regular watch to attend to it. On the afternoon of the following day, the fires are extinguished for a short time, and the fish shifted to the upper *batter*, having been first examined, and splints of wood put into those which may not be drying properly. When this is done, the lower *batter* is again filled from the pots, the fires immediately lighted, and the drying process continued as before. The fish on the lower *batter* must be turned frequently during the first twelve hours. On the second day (the fires having been extinguished as before) the slug on the upper *batter* is shifted close over to one end, to make room for those on the lower *batter* again; and so on, as before, for the two following days, by which time the first day's fish will be properly cured. It is then taken off the *batter*, and, after having been carefully examined, and those not dry put up again, the quantity cured is sent on board the vessel, and stowed away in bags. But should the ship be long in procuring a cargo, it will require to be dried over again every three months, in the sun, on platforms erected over the deck, as it soon gets damp, unless when packed in air-tight casks.

If the biche de mer is plentiful, and the natives bring it daily in large quantities, forty men will be required to perform the work of a house of the above size; and the pots will each require two hands to attend them. These curing-houses consume a large quantity of firewood daily. When biche de mer is cured, and stowed away, great care should be taken to prevent it from getting wet, as one damp fish will speedily spoil a whole bag.

EXPECTED STAR SHOWERS.—Mr. A. S. Herschel, in an article on November meteors, states that he expects a very large star shower on the 14th of this month, but unfortunately, at half-past seven a.m., a few minutes before sunrise at Greenwich, it will cross the medial line; and at about nine o'clock a.m., when the sun is fairly risen in Britain, supposing that the course of the meteoric stream keeps its appointed place, the earth's passage across the current will be complete, and the rain of fire balls and falling stars, should its return be punctual, will cease. During the night preceding and that following the height of the shower no doubt many meteors will be seen.

JAPAN.—THE MINT.

THE Government Mint consists of three establishments situated in different parts of Yeddo, there being one for each metal. The gold mint has recently been destroyed by fire, but a description of the silver mint, the only one yet visited by foreigners, may not prove uninteresting. The building, which consists of an agglomeration of wooden sheds of the poorest description, is situated in a narrow street in the mercantile portion of the capital. The eye is attracted on entering by groups of men squatting on the ground, occupied in weighing, hammering, cutting, sorting, and packing. A few officers circulate from shed to shed preserving order and issuing directions. The process of minting an ichibu is thus conducted. A lump of silver of the necessary fineness, obtained either from the Government mines, or by melting down Mexican dollars, is placed in an iron ladle and reduced to a molten state by means of a charcoal fire and a pair of blacksmith's bellows. It is next poured into a mould, from which it is taken out in the shape of thin rectangular bars, which are immediately thrown into a tub of cold water. On being taken out they are handed to a man seated on the ground, who with a pair of large fixed scissors, shears off all jagged pieces adhering to the angles. They are still further improved by hammering. They are now handed to another man who, holding a balance in his left hand and weighing them one by one, divides them into different parcels according to their weight. Another man then takes a bundle at a time and cuts off from one end of each bar what he estimates will reduce it to its proper weight, which is nineteen momme. Of this weight six fung are allowed for waste in the subsequent processes, leaving a net weight of 18·4 momme to the bar.

The next process is that of dividing the bar into eight equal portions of the size of ichibus. This is effected by a fixed pair of shears. The workman takes a bar, cuts it as nearly in half as his practised eye will enable him to do; he then divides the halves into quarters and these again into eighths. The weighing here re-commences and tests the skill of the cutter, the pieces being separated into different groups according to their weights, and those which are too light being rejected. The scissors are again in requisition to reduce the heavy ones to their proper weight, after which the light ones are again weighed and weeded out. They are now heated white hot in a charcoal fire, plunged into water, boiled and washed in a kind of brine from which they come out with a moderately bright surface. They are next very slightly milled on the two sides, and more deeply on the edges, by means of a milled hammer. They are now ready for stamping which is performed in the following manner. A man places with his left hand one of the pieces on a stationary die, while with his right he places on the top the other die, which is moveable. A second man sitting on a stool is armed with a huge hammer gives one blow on the upper die, and the coin is struck. The blows are dealt in

rapid succession, and the whole scene reminds one of a blacksmith's shop. The coins are now passed on to another man who arranges them in little frames in such a manner that they are standing about a hundred together on their edges. Boys are now employed to punch small stars on the edges by means of chisels and hammers. The coins are now weighed one by one for the last time, and the light ones rejected. They are not yet, however, current coins of the realm, the Imperial Stamp being wanting. This is added to each by means of another stamped chisel and mallet, and the coins are complete. They are, lastly, rolled up in paper packets of a hundred, each packet is weighed, and marked with a seal which serves as a guarantee of its contents, and gives it currency as one hundred ichibus.

Though every operation is performed in so primitive a manner, perfect order prevails in the establishment, every man goes through his portion of the work in silence and with the regularity of clockwork, and many evince considerable skill. There are about three hundred hands employed in the building. When the men enter in the morning they are made to divest themselves of their own clothes and put on others belonging to the Mint. At the end of the day's work, a gong sounds, when the somewhat curious spectacle is presented of three hundred men springing from the ground on which they had been seated, throwing off their clothes, and rushing, a naked throng, to one end of a yard. Here they pass through the following ordeal in order to prove they have no silver on them: their back hair is pulled down and examined, they wash their hands and hold them up to view, they drink water and then holloa, and, lastly, they run to the other end of the yard clearing two or three hurdles on their way; after which performance they are allowed to put on their own clothes and depart. The Japanese silver mint has been only twice, it is believed, entered by foreigners; the apparent absence of all restrictions with regard to touching and handling the coins would point to the probability that it is not often open to the public, but, even if it were, the manners and customs of the country are not such as would preclude a mixed assemblage of visitors from going over it and remaining to the end.

The quantity of silver at present being coined daily is 50,000 momme, which, at the rate of 2·3 momme to the ichibu, gives a daily total issue of over 21,000 bus, or about £1,500 sterling. The whole of these are produced by the simplest manual labour unaided by a single piece of machinery.

By the Tenth Article of the Treaty between Great Britain and Japan, which was copied from the corresponding Article of the American Treaty already quoted, the Japanese Government have bound themselves "for the period of one year after the opening of each port, to furnish British subjects with Japanese coin in exchange for theirs, equal weights being given, and no discount taken for recoinage." On the 1st of January, 1868, the Japanese have engaged to throw open the ports of Yeddo, Osaka, and Hiogo, to the Treaty Powers. They will thus be bound during the whole of the year 1868 to supply ichibus at those ports weight for weight against dollars,

that is, at the rate of 311 bus to the 100 dollars, the average price for some time having been about 300 bus; in other words the Government will pay a penalty of nearly 4 per cent. to foreign merchants on the excess of exports over imports. Now, according to the last published Returns, this excess at the port of Kanagawa-Yokohama alone amounted to about £1,000,000 sterling, and it is certain that no one will exchange his dollars at Yokohama at 300 when he can get 311 at Yeddo, only twenty miles off, it is evident that, supposing Trade Returns and exchange continue the same, a loss will be incurred by the Government of £40,000 on the trade of Kanagawa alone.

The Japanese Government took the first step in view of this difficulty when they concluded the Convention of June 25th, 1866, the Sixth Article of which reads thus:—

“In conformity with those Articles of the Treaties concluded between Japan and foreign Powers which stipulate for the circulation of foreign coin at its corresponding weight in native coin of the same description, dollars have, hitherto, been received at the Japanese Custom-house in payment of duties at their weight in boos (commonly called ichibus), that is to say at a rate of 311 bus per 100 dollars. The Japanese Government being, however, desirous to alter this practice, and to abstain from all interference in the exchange of native for foreign coin, and being also anxious to meet the wants both of native and foreign commerce by securing an adequate issue of native coin, have already determined to enlarge the Japanese Mint so as to admit of the Japanese Government exchanging into native coin of the same intrinsic value less only the cost of coinage, at the places named for this purpose, all foreign gold or bullion in gold or silver that may at any time be tendered to them by foreigners or Japanese. It being essential, however, to the execution of this measure that the various Powers with whom Japan has concluded Treaties should first consent to modify the stipulations in those Treaties which relate to the currency, the Japanese Government will at once propose to those Powers the adoption of the necessary modification in the said stipulations, and, on receiving their concurrence, will be prepared from the first of January, 1868, to carry the above measure into effect. The rates to be charged as the cost of coinage shall be determined hereafter by the common consent of the Contracting Parties.”

In accordance with this Article arrangements have already been made for obtaining from France the machinery required in a Mint on an European model. Immediately on its receipt, and on the arrival of persons fitted for the undertaking, a new Mint will be erected at Yeddo, and coins at once struck. It is understood that a new silver coin will be issued equal to 4 ichibus; its shape will be circular, and it will replace the gold rio or kobang, which has already almost disappeared. The immense superiority in every way of the coins struck by the new Mint will be so apparent that it will probably not be long before the rectangular ichibus will be replaced by others of a circular form.

Concurrently with these changes, it is not unlikely that the Japanese Government may adopt a measure which has been already brought before them of selecting a single coin for their standard of value. Hitherto the impracticable plan of a double standard has been attempted; gold and silver are both legal tenders; the result has been what it must ever be: the dearer coin has replaced the cheaper; the ichibu has driven out the rio from circulation, and silver is practically the only medium of exchange.

It is, perhaps, of little importance which metal be adopted for the standard. If it be silver, as it probably will, and the Government recommence the issue of gold coins, they will have to make them of such a weight that their intrinsic value is less than their nominal one, according to the relation which exists between silver and gold in the rest of the world, which is reckoned $15\frac{1}{2}$ to 1. By this means, and by limiting generally the supply of gold from their mines, they may hope gradually to assimilate the proportionate value of their metals to what it is elsewhere. A tendency has already manifested itself in this direction. In 1853 gold bullion was only $8\frac{1}{2}$ times as valuable as silver bullion; it is now about 10 times as valuable. This, at least, is the figure which was supplied by the Government; but the price which the little pure gold that there is in the market commands would point to a much higher one still. One momme weight of finest gold at this moment costs 6 ichibus 2 shus 300 mongsengs, or 6.66 ichibus, containing 15.33 momme weight of present coinage silver. Reckoning the touch at 88.523, which was that of some ichibus lately tested at Hong Kong, the momme of pure gold costs in the market 13.57 momme of pure silver. Its real value is, of course, somewhat less.

An application in the sense of the Article last quoted is almost daily expected by the Foreign Ministers; it will be for their Governments to consider whether, and if so on what terms, they will consent to a revision of the Monetary Article of the first Treaties. Japan will have much to urge—the unusual character of such stipulations and the entire absence of reciprocity; the losses she has already suffered in attempting to carry them out, and the unreasonableness of the provision which compels her to purchase in the dearest market a commodity for which she may have no need.

Whatever arrangement be ultimately agreed to, it will be important that adequate means be taken to insure an invariable standard for the coins which may be in future be put into circulation. It has been assumed in this Report that 311 ichibus are intrinsically worth 100 dollars, that having formerly been their value, and that being the rate at which they have generally been calculated, though, where both coins vary in weight and touch, it is evident that it can never have been more than a rough average. There is reason to fear that some of the late issues from the Japanese Mint have been of somewhat inferior silver. In converting, on a recent occasion, at the Hong Kong Mint a parcel of ichibus into dollars, it was found that their touch was only 88.523, and that it required 315.63 bus for the

coinage of 100 dollars; making a trifling allowance for waste of silver in the process of melting, it may be reckoned that 100 Hong Kong dollars contained as much pure silver at 315½ bus. Here is a deterioration of 4½ bus in 100 dollars, or about 1½ per cent. When Japan possesses a proper Mint, there will be no excuse if coins of uncertain weight or touch are allowed to be issued. Such a mistake would defeat the object of a free Mint. As to the standard of fineness which might be adopted, considering the important position held by the dollar in the far East, and the increased security there will be for its invariable weight and quality now that a Royal Mint exists at Hong Kong, it would seem that the Japanese Government could not do better than adopt the standard of the Hong Kong Mint, which is believed to be 89·79 fineness.

An impression seems often to have prevailed that by some cunning artifice, some inexplicable legerdemain, the Japanese Government will always be able to turn any new measure which may be agreed on regarding their currency to their own advantage. It is the opinion of the writer that an examination of the past hardly leads to such a conclusion. The Japanese would appear to have been more sinned against than sinning. When Japan first issued from her seclusion and opened her ports to foreign intercourse, her rulers were too ignorant of the value of their own metals and of the ways and dealings of foreigners to be capable of much mischief. They saw with dismay their gold flow from the country, but were either ignorant of the cause or impotent to deal with it. As was remarked a few days ago by an officer in the Finance Department: "If foreigners knew little in those days of Japanese currency, the Japanese knew less." There have been ignorances and errors on all sides: the past cannot be recovered, though it may serve as a beacon to guide the future.

The coins now in circulation in Japan may be enumerated as follows:—

1. The rio or kobang, a thin, oval, gold coin weighing ·88 momme (51·25 grains troy). According to assay made in the English Mint in December, 1862, a specimen of this coin weighed—

					Oz.	Gr. troy.
Gold	...	...	..	...	·0618	or 29·664
Silver	...	...	...	...	·0445	" 21·36
Copper	...	...	...	...	·0004	" ·192
Total					·1067	51·216

Its intrinsic worth was accordingly estimated at about 5s. 6d. sterling. The kobang is valued at 4 ichibus. It is now but rarely coined, and is fast disappearing from circulation, though under the name of rio it is still the nominal money of account.

2. The bu or ichibu, from "ichi," one, and "bu," a portion, is an oblong, silver coin, which should weigh, when new, exactly 2·3 momme (grains troy 133·95). Owing, however, to defective mintage, there is considerable variety in the actual weight of different coins all

equally new. A great many of them are made of Mexican dollar silver in the proportion of 311 to 100 dollars; their intrinsic value has accordingly been estimated at 1s. 4½²/₁₀d. sterling. Four ichibus are nominally equal to 1 rio.

3. The nibu, or 2-bu piece, a yellow oblong coin composed of gold and silver mixed. Its proper weight is 1·6 momme (93·184 grains), and it should contain ·35 momme (20·384 grains) of gold and 1·24 momme (72·217 grains) of silver. Its nominal value, as its name implies, is 2 ichibus, or half a rio.

4. The ishu, a small oblong silver coin, should weigh when it leaves the mint exactly half a momme (29·12 grains). Its nominal value is a quarter of an ichibu, but its intrinsic worth is rather nearer one-fifth of that coin. It is composed generally of Mexican dollar silver, or silver of very nearly the same standard.

5. The nishu, or 2-shu piece, is a silver-gilt coin of similar shape to the other rectangular coins. Its value is two of the last denomination, or a half-ichibu. Its weight, owing to the nature of its composition, is immaterial. It is, moreover, but little coined now, and will probably soon disappear.

6. The zeni, or mongseng, is now an almost purely iron coin of hardly any intrinsic worth. Its shape is circular, and, like the Chinese kas, it has a square hole in the centre for the purpose of stringing. Its nominal value varies from time to time. At present it is reckoned at one-1,700th of an ichibu. A few months ago it was reckoned at 1,600 to the ichibu. Though the coinage of the zeni has not been formally discontinued, none have for some time been struck at the Tycoon's Mint. The right of coining it is, however, allowed to certain of the Daimios. The iron coinage of the Prince of Sendai obtains currency in Yeddo. Prince Satsuma issues an iron coinage, but being especially intended for the Loochoo Islands, it is of another shape, and does not obtain currency in the Tycoon's territories.

7. The hachi-mongseng, or 8-mongseng piece, is a mixed iron and copper circular coin, with a square hole in the centre. It is the very same coin which formerly passed as a shimongseng, or 4-mongseng piece. It is now no longer issued.

8. The tempo, called also hiyaku-mongseng, or 100-mongseng piece, is the highest denomination of copper or bronze money, being a large oval coin, with a hole in the middle. It derives its name, "tempo," from the name of the reign in which it was introduced (A.D. 1830—1843), for the purpose, it is said, of enabling the Government to liquidate their debts at a cheap rate. According to an assay made in 1863 at the English Mint, it was found to weigh about 317 grains, and to be composed of copper, tin, and lead, in the proportions of 81, 9 and 10, which made its intrinsic value at that time to be ·446d., or about nine-tenths of a halfpenny. Its intrinsic value is less than ten of the old copper zeni or kas, but it passes for 12 hachi-mongsengs, or 96, or rather (for simplicity's sake) 100 of the new iron zenis. A few months back 16 tempos were reckoned to the ichibu, but now the number is 17, the value of the tempo being dependent on the price of

copper. The tempo is the only copper or bronze coin which is now struck. Its composition and its size are well adapted for casting, and it is decidedly the best made coin in Japan.

In addition to and alongside of the regular coined currency of Japan, there exists another uncoined and irregular currency. It has already been alluded to as having existed in former days. It consists of irregularly-shaped pieces of silver, of small fineness, and varying considerably in size; bearing, indeed, a small Government stamp, but passing according to weight. They are rarely seen in Yeddo, where the ichibu has obtained an extensive circulation, and is a more favourable medium of exchange. The existence of this currency, and the peculiar way in which it is reckoned, are calculated to give rise to some confusion in the mind of any one not well acquainted with it. At a somewhat remote period the gold rio, or kobang, was valued at 60 momme weight of this inferior silver. As the rio diminished in size and value, it still preserved its denomination of 60 momme, and when later the ichibu, or quarter-rio, was introduced, it at once passed as 15 momme, though in fact it only weighed about one-sixth.

But the anomaly does not end here. The metal lumps are so much more debased than they used to be that 100 momme weight of them are intrinsically worth only 60 of them as they used to exist, and accordingly pass current as sixty momme.

The following case will serve to explain the working of the system. A man enters a shop at Kioto, and enquires the price of a lump of standard silver bullion, which weighs exactly 10 momme. He is told, perhaps, 60 momme. He has two modes of paying this sum. The one will be to put down 4 silver ichibus, which at their nominal rate of 15 to the ichibu, is equal to momme, though in reality they only weigh 9.2 momme. The other will be to pay in metal lumps; but in this case, instead of putting down the number of mes or mommes which were demanded, he will have to weigh out 100 momme, that being the rate at which the metal lumps now pass current.

Accounts are kept on both systems of currency, varying according to place and occupation, as well as according to the subject to which the accounts refer. Thus, a horse-dealer or a carpenter will keep his books which have reference to his trade in rios, bus, and mongsengs, while a silk merchant or draper will keep his in currency momme. Government accounts are kept on both systems, though generally on the rio system.

TELEGRAPH PROJECT IN CHINA AND JAPAN.—NEW YORK, May 6th, 1867.—Dr. Macgowan, who left here last fall for China, to build a telegraph, failed to enlist Government sympathy or aid, though supported by the strongest recommendations from foreign representatives. It was said the Chinese would destroy the wires, and the government would not protect them. The enterprise was abandoned. The company purchased a cable in London to connect the coast cities. Macgowan is at Yokohama. The Japanese favour his plans, and a cable will be laid from Yokohama to Jeddo.

OUR MERCHANT SEAMEN.

IN the Police report of *The Times*, July 10th, we read that "the *Duke of Sutherland* from Adelaide arrived in the London Dock basin, Shadwell, on Saturday night, and was made fast temporarily until Monday morning, when a great many persons boarded her to solicit custom from the sailors, and among them were Jew clothiers, crimps, lodginghouse-keepers, touters, runners, and others. The prisoner, Joseph Walker, was among them, he went into the fore-castle to remove a mariner's chest and effects. A man, named George Gray, the butcher of the vessel, and now acting as shipkeeper, directed him to leave the vessel. He refused to do so and struck Gray. Daniel Anderson, the chief-mate who had the command of the ship in the absence of the Captain, went to the assistance of Gray, and he was violently assaulted by the prisoner, who struck him on the face and blackened his eye. A dock-constable, named Francis Andus, took the prisoner into custody. He was also assaulted and his coat was torn."

In the course of the enquiry, Police-sergeant Matthews of the Dock Company's own Police stated that, "the crimps, runners, Jews, touters, and lodginghouse-keepers invaded the Docks in overwhelming numbers when ships arrived, and they got on board by jumping from the swivel bridges at the risk of their lives. On Saturday night, Sunday, and Monday morning, seventeen ships entered the Shadwell-basin, and the Police officers were overpowered by two hundred and fifty or more persons."

This gives a vivid picture of what is constantly going on in the East end of London at the very time when the merchant and shipowner, whose valuable property has just been brought from every part of the world, are quietly attending Divine Service in the West, surrounded by their wives and children, enjoying the luxuries which these ships have produced.

We do not wish to rob them of one iota of this luxury which is the well earned fruit of intelligent enterprise, but we do wish that they would form a Society to consider the wants of our Merchant Seamen, and deal with them with that same intelligence which has produced so much wealth. Our seamen do not need charity but consideration. Would these gentlemen leave their own sons exposed to the temptations which came on the crews of these ships, even although their sons have the advantage of a superior education.

The very names crimp, runner, touter, are no doubt new to most of our readers, and for what were these two hundred and fifty men risking their lives in the struggle they were making to board these seventeen ships. Their number almost equals that of all the crews put together, and they only form a very small part of the many thousands who live as parasites on our seamen. Their aim was to be first to offer a glass of grog and a loan of money by which to claim their prey.

It is most common to hear sailors making good resolutions as they pace the deck during a night watch. How they will keep steady until

pay day, then go off to their friends and enjoy themselves rationally, many of the more intelligent determine to spend part of their money in the study of navigation, but too often the best of resolutions yield to the overpowering influence of three or four idle days waiting for pay day, apart from their relations and surrounded by the most overpowering temptations that can come upon a human being who has spent the last ten months in hard work with a very limited diet, and suddenly finds himself with no employment.

What parent would not rush to the rescue of a son so exposed; but it seems impossible to get anybody to think and work for our seamen, although most of their wants are capable of being met by simple and inexpensive remedies, *when* their nation can find time to consider them.

When we heard of "A Bill to Amend the Merchant Shipping Act, 1856," we rejoiced in the hope that at last the country had awoke to the importance of doing something to improve the condition of Merchant Seamen. A society of practical men had been formed with the object of finding out what was best to be done, they have published an elaborate Report.

We read of a statesman who declared that if he died our seamen's grievances would be found engraven on his heart.

But "the mountain in labour has brought forth a mouse."

This Bill deals only with the questions of limejuice, forecables, and medical inspection; it is good so far as it goes, but it is a mere drop in the ocean, and will tend to irritate sooner than please our seamen, for those who do not understand the subject will suppose that all which is required has been done, and the difficulty of again bringing seamen's wants before the public will be increased tenfold, for it is wonderful how very few know anything about the trials of the two or three hundred thousand men who are at this very time manning our ships on every part of the globe.

Last year they showed signs of a strike, and we do hope that those who understand their wants will propose such additions to this Bill as will make striking quite unnecessary. Those who have spent a life amongst them, and know how simple and inexpensive most of the remedies are, feel that "out of sight out of mind" expresses their case when they experience such numerous difficulties in trying to get their wants considered comprehensively. For instance, why should seamen be kept from three to four days waiting for their pay, generally driven to borrow money, at an enormous disadvantage, from crimps, and remain under their and worse influences until pay day, before they can go home to their families or friends?

The law as it now stands requires that they should have a quarter of their pay when their services are no more required, and the rest on pay day, but the first part of this law is very generally evaded, as if shipowners intentionally played into the hands of crimps. But this waiting until pay day (even if the shipowner's part of the law is paid) is too much for seamen whose wages are commonly halved by the time they reach the next port to another port.

Our shipowners and seamen pay heavy fees towards the support of Shipping Offices which we understand have a large balance. This should be devoted to support small Branch Offices through which the crew of every inward-bound ship should pass, and the shipping master or an assistant should see that each man gets that part of his pay which is legally due at once, take his address and promise to send him his pay and papers on pay day, if he wishes to go off to his family, so that it is not necessary for him to fall into the hands of crimps and remain idle three or four days surrounded by tempters who are too strong for human nature. Thousands of wives and mothers and children would bless those merchants and shipowners who with their mighty influence in Parliament could bring about this change in our law. And who with their own children were on that very Sunday sincerely praying, "Lead us not into temptation."

Again, married seamen have often the greatest difficulty to get shipowners to allow half-pay to their wives and families. Several will not give it. Of course this is the result of the misconduct of some married seamen who have run away. But it is hard that a whole class, who must suffer very great social privations, should have this preventable one superadded. If business men would consider the subject, a remedy might soon be found. Why should not the shipping master be authorized by Government to back the half-pay note of a seaman who has a V. G. character, charging, say five per cent., to cover risks, then the shipowner could not be a loser, and it would be infinitely better for the seamen than the present system of running up bills with shops, borrowing at ruinous interest, or letting their wives and families become workhouse paupers.

Again, shipping masters should be empowered to sell to seamen a Government annuity, they paying in lump sums whenever they like, or if they preferred it, in annual subscriptions. They should also be able to insure their lives for the benefit of their wives and families. It is very probable that many Royal Navy men would subscribe to this and so increase their pensions. The wages and effects of deceased seamen amount to a large sum each year, and might go to the benefit of subscribers.

We cannot forget that for one hundred and four years a shilling a month was stopped from the pay of every British seaman: half went to Greenwich Hospital, and the remainder was "for the relief and support of maimed and disabled seamen, and the widows and children of such as shall be killed, slain, or drowned in the Merchant Service." This was mismanaged and thousands who subscribed to it most of their sea lives are now in the workhouses of England.

Again, Sailors' Institutes or Clubs where they can get rational relaxation and refreshment are very much needed. In some ports such as Calcutta, there are always from two to three thousand British seamen belonging to ships in the port. If they go on shore, the only places open to them are dens of vice, such as Flag Street, Calcutta, where men, women, and children are employed to lead them astray. Here many a gentleman's son finds his ruin also, for want of a

respectable place open to the officers and crews of ships. Thanks to Sir John Lawrence, Calcutta has given a play-ground for seamen, on which we have good reason to hope it will build an Institute, and set the civilized world an example.

It is very easy to call sailors wild and reckless, but this is not fair until we have opened the way for them to escape their trammels. We have good reasons for saying, give them the opportunity and they will appreciate it, for in that very port of Calcutta, we have seen eight out of forty (who were not picked men) come clean to an Evening school after a hard day's work in all the discomforts of a tropical climate.

Again, our married seamen leave their families crowded in the single rooms of a house which was originally built for only one family. This has the most baneful effect. Now it is well known that married sailors' homes could be built to pay five per cent., and shipowners could always stop the rent from their pay. But although Social Science is making rapid strides amongst other working classes, the families of these most useful men who are left helpless through the peculiarities of a sea life, have not had any consideration from those thousands who are rolling in wealth, the result of their labour.

Such a state of things cannot last long. The rational way of dealing with the subject would be if the merchants and shipowners of England would form "a society to consider how they can improve the condition of merchant seamen;" and use their influence in Parliament to carry out those important changes which can be best made by legislation, in the shape of an Amendment to the Act now before Parliament.

NOTES DURING A VOYAGE BETWEEN ENGLAND AND THE BLACK SEA.

(Continued from page 554).

LEAVING Constantinople for the Crimea we had beautiful weather for our passage through the Bosphorus, and certainly there are few places in the world more interesting, whether we regard the scenery or recal the historical associations of the shores which are washed by the water of this famous Strait, dividing as it does the two continents, which chiefly figure in the world's history. When we were but a short distance from the entrance of the Bosphorus the wind drew northerly from the Black Sea, and compelled us to anchor until the following day, when one of H.M. Steamers towed us out about a league, and then left us just as it was getting dark with a heavy lowering sky, and the sea about the entrance of the Strait swarming with *birds*. Making all plain sail on the port tack to get an offing, we found as we cleared the land the sky became lighter, and by daylight next morning we found the *Black Sea* to be like all other seas in which we had sailed, a good marine blue, reflecting every tint and change in the sky above.

On the fourth night after leaving the Bosphorus, the officer of the watch reported "lightning" on the port bow, and what appeared to be

the loom of land in the same direction. The lightning turned out to be the flash of guns before Sebastopol, and the "loom of land," the high bluff between Karatch and Balaclava Bay. To those who had never seen a hostile gun fired, this intermittent light over the land like the gleams of a volcano, appeared a very strange kind of *pharos* for guiding the mariner, and no after impressions during the war were more lasting than this first night scene; although I afterwards saw heaps of slain men, and was in Sebastopol among the first after its capture.

The morning after making the land we entered Balaclava Bay, making a great noise with our guns in the hopes of getting a steamer to tow us into the harbour, and I also sent a boat in to report our arrival.

An order came out for us to be in readiness to go into harbour the next day, and as the weather was unsettled we stood out to sea until the following morning, having the flash of guns during the night again to determine our distance off shore. We returned to the bay at daylight, and anchored in thirty-nine fathoms to wait for a steamer to tow us in; and I mention the depth of water we anchored in because I know that most seamen have a dread of any depth over twenty fathoms. From my own experience, I should say, when the ground tackle is good, and the purchasing gear what it ought to be, there should be no hesitation in anchoring in forty fathoms when an occasion requires it.

The scenery around Balaclava Bay is striking. The entrance to the harbour, in its N.W. corner, is so narrow that it would escape observation if it were not known. On the shingly beach at the head of the bay, under high cliffs, we saw fragments of the wrecks which occurred in that disastrous gale in which the *Prince* was lost; and when I took a lonely stroll there a few days afterwards I saw two skeletons which had been washed ashore and had escaped observation. It took me some time to pile stones over them, and while so engaged I heard the boom of the heavy seige guns before Sebastopol, and thought of the two poor souls over whose remains a stranger was heaping shingle, that they had done with battle, whether on land or sea, and I was fain to hope that after the storm in which their life here was wrecked they had found a "haven of rest."

Should a ship be caught in a southerly gale in this bay before she has time to put to sea, no trouble should be spared to make her snug aloft, and after giving her the whole of one cable, if this does not hold her, drop the second anchor *backed with a heavy kedge*. 'This with the "backsend," or rebound of sea from the steep beach will enable a vessel to hold on to the last, unless she founders. The war steamer in which was H.R.H. the Duke of Cambridge, was saved in the gale in this manner, and well might the Duke say in that time of peril, when he saw ship after ship dashed to pieces, and expected every moment the same fate, that, "it was worse than three 'Almas,'" for there can be no doubt that in the excitement of a battle-field the thought of death, or the sense of danger, is light compared to what it is when anchored on an iron-bound lee shore with the spray from the rocks sweeping over the mast heads.

W. C. P.

THE UNITED STATES ADMIRAL.

WHOEVER originated the visit of the *Miantonomah* to our waters, there can be no doubt that such visits go far towards establishing that mutual respect and esteem between nations that is always desirable. And we are glad to find that now we have among us the senior Admiral of the American Navy. He is receiving that attention from our authorities to which he is in every respect entitled, and we are rejoiced to find him and his officers welcomed as they should be. The *Daily News* alludes thus to it. In every word we agree.

"The visit of Admiral Farragut to this country presents a valuable opportunity for the interchange of those international courtesies which have so material an influence on the policy of nations. Although the Admiral and the officers of the squadron under his command have arrived at a time when the ordinary gaieties of society are suspended, and nearly everybody is away from home, they have, of course, been made the object of such attentions as our officials are able to pay to friendly and distinguished visitors. As the head of the Navy of the United States, with a reputation second to that of no naval commander now living, Admiral Farragut has peculiar right to the attentions he is now receiving. The American Navy is the youngest but the most vigorous child of Anglo-Saxon love for the sea. It inherits with us the traditions of Blake and Anson, and represents an empire of the sea which has itself sprung from our own. Young as it necessarily is it can already point to a glorious past, and we may with certainty anticipate for it a worthy future. The English people feel no jealousy whatever at the vast naval development and progress which Admiral Farragut represents. So long as American rivalry with us at sea is limited to peaceful manifestations, we shall all rejoice at the lustre which attends the American flag. That the naval services of the two countries should fraternise, that the readiest and heartiest recognition should be accorded by the one to the merits of the other, is what on either side of the water all honest men desire. It is indeed to be particularly desired, at the present time, that all possible hospitality should be shown to our American visitors. We owe something to the American Navy, and to Admiral Farragut as its representative, for the injustice that was done both to it and to him by a large portion of our press and a small but influential portion of our people during the civil war. There can be no impropriety in reminding ourselves of this injustice, and in confessing our mistake, now that an opportunity of making amends for it seems to be offered us. It arose from our not being sufficiently known to each other. Englishmen never knew how little the slaveholding class really represented the American people, and Americans did not know how little the classes which sympathized with the rebellion here represented the great mass of the English people. But Admiral Farragut will not need to be assured of the friendliness with which America and Americans are regarded by the people of this country. He has found, and will find, nothing but the

warmest welcome, the most complete readiness to open our house to his inspection, and the most thorough appreciation of his own fame. Among the officials with whom he is brought into more immediate contact he finds neither concealment nor jealousy. They have shown him and his staff Chatham Dockyard and the Arsenal at Woolwich, and have made no secrets of any of their methods or processes, from the building of the newest ship still on the stocks to the new machinery for cutting iron, or shaping plugs, or making bricks. Accompanying the Lords of the Admiralty on their annual visit to the scenes of their extravagances, they have had the best possible opportunity of seeing how naval construction is managed on this side of the water, and probably have learned lessons which may be useful to them at home. Nor will the welcome which has been given to the Admiral and his staff in the south be grudged him in the north. In the visit he is about to pay to Liverpool, the quondam head-quarters of secession sympathies, he will find that a reaction has taken place in favour of the cause he so appropriately represents, and has so efficiently served. The wonderful prosperity of the great port of Lancashire is, in very great degree, based on the commercial intercourse between the two countries. So far as inter-communication is concerned, it is the port of England which stands directly over against the New World, and which is in most immediate sympathy and contact with it. There will be nothing in Liverpool to show that any hostility to the North still exists, so far as the Admiral is concerned. But wherever he may choose to go he will find a welcome. He needs no introduction to Englishmen. They will welcome him for his own sake, and for the sake of his country.

In Admiral Farragut the American Navy has given evidence of the possession of those sailor-like qualities which have made our own naval service so popular at home and so powerful on the sea. His pluck, and enterprise, and thoroughness were abundantly demonstrated in the naval actions of the civil war. His bold and successful attempt to force the entrance of the Mississippi in April, 1862, recalled some of the best naval enterprises of our own history. The passage and re-passage of his whole fleet past the formidable batteries of Vicksburg demonstrated not merely his personal courage, but his wonderful skill, and showed that he had not only the will to attempt great exploits, but the power to execute them. But, perhaps, the event which has most possessed the popular imagination was the bold dash past the impregnable batteries which commanded the entrance to the harbour of Mobile. The Admiral, tied amongst the rigging of his own vessel, so that not even a wound should cause him to lose his hold, and that the whole scene should be beneath his eye, leading the way through the storm of cannon shot, and running the gauntlet of probable destruction with dashing courage and brilliant success, is a picture which is as indelibly impressed on the minds of Englishmen as on those of Americans. From that time no one has ever desired to dispute the possession by the American Navy of the highest qualities of seamanship. The name of Farragut, associated with that bold and splendid

enterprise, is held in that esteem which Englishmen always give to courage, but which they still more give to the courage of a people whose qualities reflect their own. Admiral Farragut may represent American rivalry on the element which we have learned to consider our own, but it is a rivalry in qualities which Englishmen respect wherever they are found, and which, so far from leading to misunderstandings and conflicts, ought to lead to mutual admiration and esteem. It is greatly to the interest of both nations that they should more and more learn this mutual respect. They will learn it on nearer acquaintance with each other, and everything which promotes that acquaintance will promote their friendship and alliance. In the new times which are at hand we on our side shall shake ourselves more and more free from entanglements in the East, and cultivate our relations with the West. The continent of Europe may not perhaps be less to us than it has been, but the Western continent will be infinitely more. Such visitors as Admiral Farragut and his staff are therefore doubly welcome now. The era of misunderstandings is over, and that of enlarged friendly intercourse has begun, and every occasion of becoming better acquainted with each other, every exchange of international courtesies, and every opportunity for the expression of mutual goodwill and esteem, will serve to strengthen the personal ties and multiply the personal friendships, which, even more perhaps than the policy of governments, tie kindred nations to each other."

OVERLAND ROUTE TO CHINA.

To the Editor of the Nautical Magazine.

SIR,—In one of the public journals have appeared articles in favour of an overland route to China, from Rangoon to the frontier town of Kiang Hung.

Would it not be well to see if a *much easier* route is not to be found by going right up the Irrawaddy to Bamoo, and making a rough survey between that place and the Chinese frontier of Yunnan. This northerly route has also the advantage of being nearer the north-eastern frontier of British India, with a view to any future connection or extension of the line in that direction.

In 1863 I went to Mandalay to see the King of Burmah about English steamers going up the river, and I had no trouble in getting his permission; the truth being that his Burmah Majesty would be glad to allow anything that promises to increase his revenue.

I may mention that I am acquainted with the navigation of the Ganges, Berhampooter, and the Irrawaddy, and that of these three great rivers, I consider the navigation of the Irrawaddy to be the least difficult.

Should this letter fall under the notice of a writer to the *Times* upon the above subject, who signs himself "G.," Isle of Wight, I shall have much pleasure in giving him some additional information.

Cedar Cottage, Abergavenny.

W. C. P.

ABYSSINIA.

THE following letter from Dr. Blanc one of the prisoners in Abyssinia gives so vivid a picture of one cause among others of our expedition to that country, that we are induced to preserve it as the first of our records of that very novel proceeding.

LETTER FROM ONE OF THE PRISONERS AT MAGDALLAH.

(From the *Bombay Gazette* of Sept. 26th.)

The following letter, received by a gentleman in Bombay, from Dr. Blanc, one of the prisoners at Magdallah, has been courteously placed at our disposal by the recipient, and will be read with interest, we doubt not, by the public :

“Magdallah, July 23rd, 1867.

“My dear —,—I really do not know whether I am writing to the living or the dead, to a confirmed bachelor, to a happy Benedict, or to a *flaneur* at the Paris Exhibition. All your fault, dear friend, —since I left Aden not a line ! Well, I will not bully you too much, as you might retort the same argument on me, the only difference being that you *know* where I am, and I only *guess* where you are. Never mind—at the eve of a serious crisis we must not forget our friends, so that even should the worst happen, they might keep our memory as a pleasing thought. I suppose that from the papers you must from time to time have seen something about our adventurous mission, its rise and fall, and lastly all its elements being consigned to *Carcere duro* ! The summary of our career in this country is easily made. First period of sunshine, basking in the smiles of royalty, from January 28th, 1866, to 15th of May of the same year. On that day great *fiasco* ! From honoured guests we were turned into prisoners, insulted, seized by the executioner's myrmidons, belts, and caps violently wrenched from us, our uniforms torn ; we were dragged along the audience-hall in that humiliating position before all the officers of Theodorus' army.

“From that the second period begins, all of darkness and of anxiety, always worse and worse. After a few days of respite and quiet, semi-prisoners at Gaze from the day of our seizure to the end of May ; for a couple of weeks we were pretty free at Gaffat. On the 25th of that month, second confiscation of our arms and property (the latter afterwards restored) ; trial and confinement in a black tent near the king's house at Debra Tabor. I was, however, allowed to return to Gaffat on account of typhus and cholera prevailing there. 3rd of July, Mr. Rosenthal and myself seized at Gaffat by the king, brought to Debra Tabor, tried, sent into a dark house where we were obliged to have candles lighted all day. 5th July, sent to Magdallah, arrived at the fortress on the 12th of the same month, travelling without bedding or change of clothes through the rainy season. Four days afterwards chained by the leg like rabid camels all in one small room.

Afterwards Rassam got a house, Pridieux and myself a small shed unfit for even an Irish pig, still better than the previous omnibus system. Since then more than a year ago, we have remained *in statu quo*, the irons gradually wearing away every muscle of our inferior extremities, and long confinement ruining our health and weakening our brain. However, left alone we managed to make ourselves more comfortable.

"In November last Pridieux and myself built a better hut, Cameron also a small and modest one, it is true, Rassam as good a house as can be found in Abyssinia. Stern and Rosenthal live in the first house assigned to me, Pereus and Pietro (an Italian) have small huts for the daytime, at night in 'the kitchen.' All we wish is to be able to remain as we are until 'Thomas Atkin' comes. Our chains are no fun, however—heavy, disagreeable things. Rassam being, as the natives say, the 'master of the dollars,' managed to get some lighter ones put on, a kind of patent ring invented by our former head jailer; but what can poor fellows like Pridieux and myself expect? 'Master of salts,' a house in common, used also as a dispensary, heavy fetters. Contempt and impertinence are all the natives bestow upon the poor white men. Dull times, no books, seldom papers, nothing but our own selves to snarl at, but Theodore to curse. Bad food, horrid beds, tyranny and bullying from every one. Dear friend, pity the European captives of Theodorus.

"But enough of ourselves—a few words about our 'kind dear host,' we have not brought him good luck—he is going down so fast that he must collapse shortly into a mere brigand—why he is one already! No country, no people, no friends, he lives by plunder, and passes the time by torturing or killing, not his enemies, he seldom can get hold of them now, but his friends and his soldiers. He seems to have adopted a new system of religion and medicine; he sacrifices daily some hundred victims, to what divinity I cannot say, unless it is something like the furies he worships; and to cure the excitement of his nervous system, the cries of those he burns alive are the only solace he can find. When we arrived he imposed upon us by his sweet tongue; we saw only the wild beast at rest, in its drowsy state, we thought him good, the rebels bad, and that virtue and goodness would at last prevail over rebellion and mutiny. But the mask soon fell, even at Gaze we saw the six feet long hippopotamus whip tearing to pieces the delicate skin of an Abyssinian lady, and her corpse removed on a small mat trickling with her blood. But this was nothing. Gondar disappeared in flames, kindled by the 'father of his people'; so that the rebels on the surrounding height might see far and distant the glare of the doomed city; priests, women, and a few wretches supposed to be rebels were added as fuel; so that the fire should not go out by want of materials. Chiefs after chiefs were chained, tortured, and crowded together in small huts; day after day new murders, new tortures, until one morning he enjoyed the sight of 670 of his soldiers butchered on a mere suspicion of their intention of desiring to run away. This, however, too much; even the

greatest scoundrels around him got frightened, desertion of all the men from the few provinces until then still faithful to him took place the next morning, so that the *diner* that day off 670 corpses cost him the remainder of his kingdom—rather a heavy bill of fare.

“In this country there is no rule, no more sovereign, anarchy alone rules supreme, peasants murder soldiers, soldiers peasants; and Theodorus both. The Galla are in the field, Wakshum Gobaze is knocking about, anxious to have a shy at Theodorus, but afraid of his own soldiers. This cannot last very long; the peasants kill their cows and leave the soil to take care of itself; they stand in arms and defend, in their way, their property. For us it is bad enough; little chance we have if our people do not come soon. Theodorus on his last legs does not stand on trifles. What cares he now about the Queen of England, or her friendship? He wants blood, nothing else; of black he ought to be satiated, next he will try what the white man’s is like. Indeed he has nearly begun, as a few days ago he killed the six remaining servants of the five Europeans, who last January tried to escape; one of these servants was a native of Massowah, so you see he is getting on. Our only hope is that, reduced as he is, he will not venture here, having to cross eighty miles of country, all in arms against him. Specially if Gobaze, his blood enemy, is in the neighbourhood; these two must come to a clash some day; for our sake the sooner the better; though as far as liberty is concerned, it matters little. We would not be allowed to leave the country, only an army can do that. No one in this country believes in the white man any more, and unless they get a practical lesson, diplomacy will be of no avail; still in Gobaze’s hands our lives are safe. If Theodorus comes here after the rains, I can only say, in that case ‘*ora pro nobis.*’ Good bye. Send me all the news and extracts of the Indian papers about our affairs. I should like to see their opinions.—Believe me, yours affectionately,

(Sd.) “H. BLANC.”

NEW BOOKS.

THE NILE TRIBUTARIES OF ABYSSINIA AND THE SWORD HUNTERS OF THE HAMRAN ARABS. *By Sir Samuel Baker, M.A., etc.* London: Macmillan. October, 1867.

THE lovers of the chase will revel in this volume. Adventure of the most thrilling kind is its principal theme. Our already filled pages oblige us to reserve it for future discussion. But to the following letter we append an extract from it that will account to our correspondent for his *sand shower*.

On a voyage from the Black Sea to England in the Norwegian barque, *Hong Sverri*, I experienced, under the African coast, between Cap Bon and Algiers, a strange kind of weather. From the 20th of September to the 25th, the thermometer varying all the time between

88° and 80°, while the barometer was gradually falling from 30·13 to 30·08. The wind changed in this time continually round the compass with squalls, as were seen to come up in thick clouds from the S.E., and draw round the horizon over south and west, and sometimes turn back round to the northern. Thus the weather remained until the 23rd, when the squalls became very strong; the wind at the beginning blowing from several quarters, but at last settled down from the northward, and with each squall followed a tremendous heat and haze, carrying with it a "red brown" dust which covered the vessel. It was very fine dust, but seemed under the fingers to be a very minute sand. This dust continued to fall for almost eighteen to twenty hours. It seemed to me, as far as I could observe the course of the clouds, that this dust must have come from the African coast, where at the time, or before, I should think a sirroco has been blowing. The vessel's position was between 37° 52 and 38° 9 north latitude, and 6° 15 and 4° 53' longitude east, in sixty to eighty miles from the coast.

CARL F. HANSEN, *Master*.

On his way to the Abyssinian mountains, Sir Samuel thus speaks of the desert sandy wanderers:—

"The rains have commenced in the south and are extending towards the north; the cold and heavier air of the southern rain clouds sweeps down upon the over heated atmosphere of the desert, and produces sudden violent squalls and whirlwinds when least expected, as at that time the sky is cloudless.

"The effect of these desert whirlwinds is most curious, as their force is sufficient to raise dense columns of sand and dust several thousand feet high; these are not the evanescent of a changing wind, but they frequently exist for many hours, and travel forward, or more usually in circles resembling in the distance solid pillars of sand. The Arab superstition invests these appearances with the supernatural, and the mysterious sand column of the desert wandering in its burning solitude, is an evil spirit, 'a Gin' (genii plural, of the Arabian Nights). I have frequently seen many such columns at the same time in the boundless desert, all travelling or waltzing in various directions at the wilful choice of each whirlwind: this vagrancy of character is an undoubted proof to the Arab mind of their independent and diabolical origin.

"And thus the Norwegian barque seems to have got into bad company."

NOTES ON NOVELTIES.

WE little expected having ever to record the capture of a *Fenian privateer* in our pages, but the following is so much like it that we preserve the curiosity, whether it turn out true or untrue—

CAPTURE OF A SUPPOSED FENIAN PRIVATEER.—The *Glasgow Herald* publishes the following from its Greenock correspondent:—

"Intelligence has been received in town from H.M.S. Lion, presently stationed at Lough Swilly, that a few days ago a suspicious-looking craft being observed in the offing, a boat from the war ship was promptly manned and went in chase. Coming up to the craft, a request was made by the officer in charge of the Lion's boat to the person in command of the unknown craft that she should produce her papers. The request was declined, and intimation was given that the first man who dared to set foot on board would be thrown into the sea. Upon this the stranger craft was promptly boarded by the blue jackets, and the crew, nine in number, of the craft being seized, they were put in irons and taken on board the war-ship, where they await orders from the Admiralty. The vessel has also been detained. Details are not given as to the cargo of the captured craft, but as she had no papers on board, and is suspected of being a Fenian privateer, considerable interest is attached to the result of the investigation now being made." No confirmation of this story appears in the Dublin papers.

We leave the foregoing curiosity as it is, and can only find room for the following, a subject to which we shall have ample occasion to return in an early number, with the satisfaction of having lent our aid towards the establishment of that stringent law which comes in force in January next.

A medical contemporary furnishes a deplorable picture of the inefficiency of the existing laws for the protection of merchant seamen. Of the six poor fellows who were taken into the *Dreadnought* hospital ship, on the 26th of August, four were so reduced by scurvy that they had to be hoisted on to the medical deck. They are now improving, but their condition is a sad one, and the story of their wrongs, as told by one of their number, is exceedingly painful. It appears that they were four months out from Calcutta, having twice crossed the line, and during all that time the fore-castle was kept in a most foully unclean state. The sailors requested the mate to have it cleaned, lest it should "breed a plague," but the request received no attention till the second time the ship crossed the line, and then something was done in the way of painting. As a rule, however, the condition of the fore-castle must have been loathsome in the extreme, for, in the language of the sailors, it "stunk." The only provisions were salt beef, salt pork, and biscuit, and they were often compelled to eat beef which had been condemned on the voyage out as unfit for human food. Not a particle of vegetable was served out during the voyage, save a few preserved carrots to those men who were laid up by scurvy. The only drink was water, and this was the water of the Hooghly—not the most wholesome or refreshing beverage in the world. We have omitted to mention tea and coffee, both of which they had in addition. But how were these prepared? This is the recipe: The coffee having been placed in a vessel, three quarts of boiling water were poured on it, and after standing for a few moments "a couple of buckets of water" were added. The farce of supplying lime-succ was, through, a bottle containing about twenty-six ounces

being given weekly to every five men; but it contained an ugly deposit, and before the ship had nearly completed her voyage it was "as black as your coat." The facts need little comment; they speak too strongly for themselves, and we trust that the owners of the *Riversdale* will afford us some explanation of them. Gross negligence and utter inhumanity have been shown by someone, and the question now arises, who is the responsible person? It is simply monstrous to suppose that so glaring a case of cruelty as that to which the crew of the *Riversdale* testify should be allowed to go unpunished. It is rumoured that a Board of Trade inquiry will be made into the matter, and we trust it may be so.

ROYAL NATIONAL LIFE-BOAT INSTITUTION.

ON the 3rd of October, a meeting of this institution was held at its house, John Street, Adelphi; Thomas Chapman, Esq., F.R.S., V.P., in the chair. There were also present, Sir E. Perrott, Bart., Admiral Sir William Hall, K.C.B., F.R.S., Admiral Gordon, Captain Arrow, deputy master of the Trinity House; J. Griffith, Esq., Admiral Ryder, Admiral M'Hardy, A. Boetefeur, Esq., Captain De St. Croix, Captain Ward, R.N., inspector of life-boats to the institution; and Richard Lewis, Esq., the secretary.

The minutes of the previous meeting having been read the silver medal of the institution, and a copy of its vote on parchment, were ordered to be presented to Captain Edward Kearon, and a reward of £30 13s. 6d. to the other men of the crew of the institution's life-boat at Arklow, Ireland, for putting off on the night of the 11th September, during a fierce gale from the S.E., and in a very heavy sea, to the smack *Kate and Mary*, of Arklow, which was riding at anchor in that bay in a dangerous position, with only a boy on board. The master of the smack, who had been taken off in the life-boat, was placed on board his vessel, which subsequently got away in safety.

A reward of £16 10s. was also voted to pay the expenses of the institution's life-boat at Whitby, in putting off on September 30th in a gale of wind and heavy sea, and rescuing the crew of four men of the schooner *Commot*, of Whitby, which had stranded on Whitby sands.

The sum of £17 18s. was also granted to pay the expenses of the society's Scarborough life-boat in going out at midnight on September 29th, and saving four men from the brigantine *Sybel*, of Yarmouth, which had been in collision with another vessel in Scarborough Roads, and was in a disabled state. A coble had previously gone out to this vessel, but on account of the heavy sea that was running, she could not venture alongside to rescue the crew.

A reward of £5 15s. was likewise voted to pay the expenses of the society's life-boat at Howth, Dublin Bay, in putting off during a heavy gale on the 12th September, to the assistance of the schooner *Splendid*, of Dublin, which was seen making for the harbour in a disabled state, and had afterwards anchored near the Baldoyle sands. The life-boat took off the captain, and also brought the schooner safely into Howth harbour, and moored her alongside the pier.

A reward of £9 10s. was likewise voted to pay the expenses of the institution's life-boat at Orme's Head, in putting off on the 20th September, in a strong wind, and with the assistance of a steamer, taking the disabled smack *Jane*, of Carnarvon, and the four persons on board, safely into Beaumaris.

A reward was also granted to the crew of the institution's life-boat at Newbiggin, for putting off during a heavy gale, and bringing safely into harbour, seven fishing boats and their crews of thirty men, belonging to North Sunderland, Newton, and Caister, which were in imminent danger while making for the south.

Rewards, amounting to £40 13s., were also granted to the crews of the society's life-boats at Castletown, Dundalk, Margate, and New Brighton, for various services during the recent heavy gales.

A reward of £15 was voted to the crew of the yawl *Eclat*, of Caister, for putting off in a strong N.E. gale and heavy sea, and rescuing, on the 26th July, from a small boat ten persons belonging to the sloop *Favourite* and schooner *Unity*, of Goole, which had been in collision, and afterwards became total wrecks, on the Norfolk coast.

The committee expressed their condolence with the family of the late John Diston Powles, Esq., on the decease of that lamented gentleman. He had been an active member of the institution for upwards of forty years, and had been one of its best and warmest friends.

Payments, amounting to nearly £4000, were ordered to be made on various life-boat establishments, making a total of £23,290 which the institution had expended on its life-boat stations during the current year. It had also, during the same period, contributed to the rescue of seven hundred and sixty-two lives from various shipwrecks, and had been directly or indirectly instrumental in saving sixteen thousand six hundred and sixty-three lives since its first establishment.

It was stated that the pressure on the funds of the institution, in carrying on its great and national work was very heavy at the present time, and that some of the funded capital of the society would probably have to be sold out to meet these pressing demands.

It was reported that legacies had been left to the institution by the late Miss Maria Irlam, of Dibbinsdale, Chester, £1000 duty free; the late Mrs. Sarah D. Woodhouse, of London, £100 free of duty; and the late Robert Shepherd, Esq., of Rochdale, a reversionary legacy of £1000. The executors of the late Mrs. Morgan, of Cheltenham, had also placed at the disposal of the institution £650, from the residue of her estate. A contribution of £50 had also been received from the Ancient Order of Foresters, through their able secretary, Samuel Shawcross, Esq., in aid of the support of the life-boat *Forester*, at Newquay, Cardigan Bay. The order was also collecting funds in aid of an additional life-boat.

It was also reported that the institution had recently sent new life-boats to Mullion in Cornwall, Brighton, and Dundalk in Ireland.

Several of the railway and steam-packet companies had kindly given free conveyances to the boats. A grand demonstration had taken place with the Mullion boat at Penzance on the 10th September. Similar demonstrations had also taken place with the Brighton and Dundalk life-boats. These three boats were the gifts respectively of the Wesleyan Methodists, of the London Sunday Schools, and of the Stockport Sunday School, to the institution. It was reported that another of the large safety fishing boats of the institution had been built and launched. It had been taken charge of by some fishermen belonging to Anstruther, N.B.

It was decided to form a life-boat station at Almwch, on the Anglesey coast. A lady in Berkshire had also placed at the disposal of the institution £420, to pay for a new boat and carriage. She wished the boat to be named the *Florence*.

Reports were read from the inspector and the assistant inspector of life-boats of the society on their recent visit to the coasts.

The proceedings then terminated.

Nautical Notices.

[Communications for the Editor of the *Nautical Magazine* to be addressed to him at 31, Poultry.]

PARTICULARS OF LIGHTS RECENTLY ESTABLISHED. (Continued from page 579.)

Name.	Place.	Position.	F. or Fl.	Ht. in Ft.	Dist seen Mls	Remarks, Bearings are by Compass.
53. Spitsand	Spithead	Buoy red, on outer Spit.	...	...	...	Spit (bell) buoy N. b. E. $\frac{3}{4}$ E. $5\frac{1}{2}$ Cab. See Note (a).
54. Waderobod	Sweden	58° 32' 7" N.	R.	108	15	Est. 22nd Sept., 1867, once a minute, a Red and White Light
Heg Holm	Norway	11° 2' 5" E.	...	...	...	Est. 15th August, 1867: <i>inwards</i> a Red Light.
55. Hooper Strait	S. Coast Chesapeake Bay	S.E. from Lt. Vessel	...	...	...	Est. 14th Sept., 1867. On shoal in $6\frac{1}{2}$ feet. 300 yards from Lt. House, and on piles.
56. Pembroke Reach	Milford Haven	...	...	...	...	Alterations: See Note (b).
57. Burriana	Gulf of Valencia	39° 53' 6" N. 0° 3' 8" W.	F.	...	...	Est. 30th Sept., 1867.
I. Ponza Battery	Italy W. Coast	...	...	...	...	Est. 1st Oct., 1867. White Light now Red.
Lefchimo Point	Corfu	...	...	...	...	Light ceased temporarily.
58. Chifu	Kung-kung I. largest	Yellow Sea	F.	240	18	Recent. See also p. 450. Chifu.
59. Kolaba	Bombay Har.	Entrance	R.	...	...	Est. 1st May, 1868. Light Vessel's light is now Red. R. every 20 seconds.
60. See Note (c).	Newfound- land	Cape Freels	...	...	...	Account of dangers off C. Fr.
61. Homlung	Christiana	59° 1' 4" N. 11° 2' 4" E.	F.	...	...	Est. 1st October, 1867.
Stabben	Norway W. Coast	61° 36' N. 4° 57' 5" E.	F.	...	...	" " Red towards Floro.
Kind Island	" "	61° 33' 5" 4° 46' 7" E.	F.	...	...	" "
Stot. Sesquier Island	" N.W. Coast	66° 56' 5" 13° 29' E.	F.fl.	...	...	" " Flash every two minutes.
62. Buoy on the	Rinana Shoal	R. Shannon	...	...	...	See Note (d).
63. Perseus rock	Japan In. Sea	...	...	...	...	See Note (e).
64. Sombrero I.	Antilles	18° 35' 6" N. 63° 27' 8" W.	R.	150	20	Est. Jan., 1868. Every minute.
Amelia I.	Florida	Fernandina	...	...	...	Moveable for Crossing the bar. In Front of Amelia Light.
65. Orfordness Low Light	England E. Coast	...	...	...	...	Delay in alteration. See Note (f).
Patterson rock	Scotland W. Coast	Firth of Clyde	...	...	...	Alteration. See Note (g).
66. Chipiona	Spain S.E. Coast	36° 44' N. 6° 26' 5" W.	R.	220	22	Est. 28th Nov., 1867, every minute. Note (h).
67. Jane Island	U. States Chesapeake	...	...	35	10	Est. 7th Oct., 1867. See Note (i).
68. Kish Bank Buoys	Ireland W.C.	...	...	...	...	See Note (k).
69. Tybee Island	U. States	32° 1' 3" N. 80° 50' 5" W.	F.	150	19	Est. 1st Oct., 1867. For crossing the bar 870 yards in Front of the main Light.
Tybee Beacon	"	Savana River Entr.	F.	...	...	" "
70. Biezeling- scheham	South Beveland	Schelde River	F.	13	9	Visible as a guide for the Channel
Baerlandt Point	Ditto	Ditto	F.	13	9	Ditto ditto

F. Fixed. F.fl. Fixed and Flashing. R. Revolving. I. Intermitting. Est. Established.

(a) From this red buoy Gilkicker point is N.W. $\frac{1}{4}$ W.; also Horse Fort, S.S.E. $\frac{1}{4}$ E., 1 mile, and the eastern side of No-mans-land Fort in a line with the Yarborough monument on the Isle of Wight.

DIRECTIONS.—There is about the same depth of water, viz., from twenty to twenty-three feet, over the bank between this buoy and the Spit (bell) buoy, but vessels of a heavy draught should, on entering or leaving Portsmouth harbour, unless near high water, pass to the southward and eastward of the Outer Spit buoy.

Variations 21° Westerly in 1867.

(b) The four buoys marking the north side of the Dockyard bank are painted red, the western, or turning buoy, marking Carr spit, having a Staff and Globe. The two buoys marking the shoal off Weare point and Neyland spit are painted black.

(c) *Rocks in the vicinity of Cape Freels.*—The following is a list of Rocks and their positions lately discovered on the West Coast of Newfoundland, by Lieutenant James H. Kerr, in charge of the Survey on that Coast.

Snap Rock, awash is in lat. $49^{\circ} 53' 30''$, long. $53^{\circ} 41'$, West of Greenwich, from it—Funk island bears S.E. $\frac{1}{2}$ S., $22\frac{1}{2}$ miles. Barrack rocks bear W. $\frac{1}{2}$ N., $12\frac{1}{2}$ miles. Offer Wadham light bears S.W. $\frac{1}{2}$ S., $17\frac{1}{2}$ miles.

Pigeon Rock has 2 fathoms on it, and from it—South Barrack rock bears North, 3 miles. Extreme of Cape Fogo bears S.W. by W. Joe Butts point bears N.W. $\frac{1}{2}$ W. Pigeon island bears W. $\frac{1}{2}$ N.

Lanes East Rock has 2 fathoms on it, and from it—The West End of Barracks bears N.E. by E. $\frac{1}{2}$ E. $1\frac{1}{2}$ miles. Round head bears W. by N. Extreme of Cape Fogo bears S.S.W. $\frac{1}{2}$ W.

Lanes West Rock has 3 fathoms on it, and from it—Round head bears W. by N. $\frac{1}{2}$ N., 2 miles. Lanes East rock bears E. by S. $\frac{1}{2}$ S., $1\frac{1}{2}$ miles.

Clam Rock has 9 fathoms on it, and from it—Offer Wadham light bears S. $\frac{1}{2}$ W., 7 miles. South extreme of Cape Fogo bears W. $\frac{1}{2}$ N.

Pinnacle Rock has 10 fathoms on it, and from it—Cape Fogo, in a line with Round head, bears N. $\frac{1}{4}$ W., 2 miles. Copper island summit bears S.W.

White Clam Rock has 9 fathoms on it, and from it—Cape Fogo, in a line with Round head, bears N. $\frac{1}{4}$ W., $4\frac{1}{2}$ miles. Copper island summit bears S.W. by W. $\frac{1}{2}$ W.

Frampton Rock has 4 fathoms on it, and from it Copper island summit bears S.E., $2\frac{1}{2}$ miles.

Fishing Rock has 9 fathoms on it, and from it Copper island summit bears S.E. $\frac{1}{2}$ S., $4\frac{1}{2}$ miles.

Western Head Rock has 3 fathoms on it, and from it—Western head bears North, 1 mile. South extreme of Cape Fogo bears E. $\frac{1}{4}$ N., $2\frac{1}{2}$ miles. Burnt point open of Wild point bears W. by N. $\frac{1}{2}$ N., 4 miles. Copper island summit bears South, 5 miles.

East Rock has 10 fathoms on it, and from it Offer Wadham light bears W. $\frac{1}{2}$ N., $2\frac{1}{2}$ miles.

Outer East Rock has 12 fathoms on it, and from it Offer Wadham light bears W.N.W., $5\frac{1}{2}$ miles.

Brenton Rock has 5 fathoms on it, and from it *Funk island* centre bears E., 6 miles.

Rocks also exist, to which no names have been given, as follows :—

6 fathoms	<i>Funk island</i> centre bearing	S. by E. $\frac{1}{2}$ E.,	2 miles.
10	" "	S.E. $\frac{1}{2}$ E.,	2 "
15	" "	E. $\frac{1}{2}$ S.,	1 $\frac{1}{2}$ "
10	" "	E. $\frac{1}{2}$ N.,	$\frac{3}{4}$ "
3*	" "	N.E. by E. $\frac{1}{2}$ E.,	2 "
3	" "	N.E. $\frac{1}{2}$ N.,	2 "
9	" "	N.W. $\frac{3}{4}$ W.,	2 "
11*	" "	N.W. by W.,	1 $\frac{1}{2}$ "
15*	" "	W. $\frac{1}{2}$ N.,	2 $\frac{3}{4}$ "
6	" "	S.W. by W.,	1 $\frac{1}{2}$ "

* These rocks are parts of narrow banks, each upwards of half a mile long N.E. and S.W., with less than 30 fathoms on them, the others being small with from forty to sixty fathoms close round them.

The position of *Funk island* centre is in lat. 49° 45' 29" N., long. 53° 10' 49", West of Greenwich.

South Coast—Placentia Bay—Merchant Shoal.—While examining the course of the Telegraphic cable from *Placentia* to *Sydney*, in *Cape Breton island*, a patch with 5 fathoms was discovered, which is supposed to be the *Merchant Shoal*, from it—*Verde point*, *Placentia*, bears S.E. $\frac{3}{4}$ E., 15 miles. South-west point of *Morasheen island* bears N.E. $\frac{1}{2}$ N., 8 miles.

It is reported that from this point towards *Morasheen island* many shoal patches exist with deep water amongst them.

Variation at Funk Island 33° 20' Westerly in 1867.

at <i>Cape Fogo</i>	36°	"	"
at <i>Placentia bay</i>	30°	"	"

(d) The Office of Irish Lights, Dublin, has given Notice, that a red conical buoy, marked *Rinana shoal*, has been placed to mark the south-west edge of the *Rinana shoal*, off *Scattery island*, *Shannon river*.

It lies in six fathoms at low water springs, with the following marks and bearings :—

Ray peak a little south of the cliff of *Kilcraden head* W. by N. $\frac{3}{4}$ N.

The highest part of the battery on the south point of *Scattery island*, in a line with the round tower N.E. by N.

South Coast—Temporary Buoy on Barrels Rock.—Also, that the perch on the *Barrels rock*, *Courtnacsherry bay*, having been washed away, a black can buoy, marked *Barrels rock*, has been placed sixty fathoms S.W. $\frac{1}{2}$ W. of the rock, and will remain there until the perch is replaced, when it will be removed.

Variation 26° Westerly in 1867.

(e) A rock has been discovered (by H.M.S *Perseus* striking on it) in the *Kúrusima strait*, leading from the *Misimi-nada* to the *Bingo-nada* of the inland sea, and, as it lies in the fairway of ships, is of much importance.

It is named the *Perseus rock*, is about 20 feet in circumference, and has only 7 feet on it at low-water springs; it bears E. $\frac{1}{2}$ N., a third of a mile distant from the north point of *Kosima*, and from it—*Kosima*, north extreme, bears W. $\frac{1}{2}$ S. *Kosima*, south-east extreme, bears S.W. by S. *Masima*, west extreme, bears S. $\frac{1}{2}$ E. *Masima*, north extreme, bears S.E. $\frac{3}{4}$ S. *Tsusima*, west extreme, N. $\frac{1}{2}$ E. *Tsusima*, north extreme, bears

At a quarter of a cable from the *Perseus rock*, from 5 to 7 fathoms—

water, and between it and Kosima no soundings under 20 fathoms, thus leaving a clear passage of 2 cables.

Between half ebb and low-water the position of this danger is indicated by a strong ripple.

Variation 2° 50' Westerly in 1867.

(f) With reference to Notice to Mariners, No. 29 (see page 405), the Trinity House, London, has given Notice, that, owing to unavoidable circumstances, the *red* cuts intended to have been shown from the low lighthouse at Orfordness, on or about the 1st September, will not be ready for exhibition until the end of the year, and that further notice will be given as soon as a definite time for their exhibition can be fixed.

(g) The Commissioners of Northern Lights have given Notice that a *black* bell buoy, with an iron spar cage containing a bell, surmounted by a staff and ball, has been placed near to Patterson's rock, eastward of Sanda island, instead of the can buoy hitherto moored on the spot.

(h) Its position, as given is in lat. 36° 44' N., long. 6° 26½' West of Greenwich. From it San Sebastian light bears S. ½ E., Malandar point light E. by N. ¾ N., and the centre of the Salmedina rocks W. by N., nearly 1½ miles.

On the same night that this light is exhibited the light at present exhibited from the church of Chipiona will be discontinued.

Variation 20° Westerly in 1867.

(i) At the mouth of Annamessix river, on the shoal, which extends from the south-west point of Jane island towards the light-vessel, three quarters of a mile distant from each, in ½ feet water, mean tide; the light-vessel stationed there will be removed.

(k) ALTERATION OF BUOYS BETWEEN THE KISH AND TUSKAR LIGHTS.—With reference to Notice to Mariners, No. 23, issued from this Office, dated the 26th of April, 1867, relative to the alteration of buoys between the Kish and Tuskar lights, the Corporation of the Port of Dublin has given Notice, that the following alterations have now taken place.

KISH BANK.—*North Kish buoy* is now a conical *black* buoy with staff and ball and marked *Kish buoy, No. 1.*

Middle Kish buoy.—An additional *black* can buoy, marked *Kish buoy, No. 2,* lies midway between the North and South buoys, on the outer edge of the bank, in 15 fathoms water.

South Kish buoy is now a conical *black* buoy, marked *Kish bank, No. 3.*

CODLING BANK.—*Codling Bank buoy* moved 2 miles N. by W. ¾ W. of its late position, is now a can buoy, coloured *black and white* in vertical stripes.

INDIA BANK.—*India Bank buoy* is now a conical buoy, *black and white* in horizontal bands.

ARKLOW BANK.—*North Arklow buoy* is now *red* with staff and ball, and marked *Arklow bank, No. 1.*

Intermediate buoys.—There are three *red* can buoys on the outer edge of the bank equally distant from the North and South buoys, and each other, marked respectively *Arklow bank, No. 2, Arklow bank, No. 3, and Arklow bank, No. 4.*

South Arklow buoy is a *red* conical buoy, marked *Arklow bank, No. 5.*

BLACKWATER BANK.—*North Blackwater buoy* changed to a *black conical buoy*, has staff and ball and is marked *Blackwater, No. 1.*

Intermediate buoys.—The two intermediate buoys have been changed to *black can buoys*, and are marked *Blackwater, No. 2,* and *Blackwater, No. 3.*

South Blackwater buoy is a *conical black buoy*, marked *Blackwater, No. 4.*

LONG BANK.—*North long bank buoy* a *conical red buoy* has staff and ball, is marked *Long bank, No. 1.*

Middle buoy.—An additional *red can buoy* lies equi-distant from the North and South buoys and is marked *Long bank, No. 2.*

South Long bank buoy a *red conical buoy*, is marked *Long bank, No. 3.*

TO CORRESPONDENTS.

OUR friends in the book way will bear with us. We have not been so much pressed for space for a very long time.

Our correspondent "C. Renaut," shall be attended to in our next. Surely the proposal about the log-line is a mountain of a molehill!

Our Jamaica letter is received. What! another case of *scuttling*?

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, in October, 1867.—Sold by J. D. Potter, 31, Poultry, and 11, King Street, Tower Hill, London.

729. DEM = 0·20 Nova Scotia, Sambro island to Causo Cape. Captains Bayfield and Orlebar, R.N. 1867. 2s. 6d.

730. DEM = 0·20 Nova Scotia, Sable Cape to Sambro island. Captains Bayfield and Shortland. 1867. 2s. 6d.

2083. DEM = 0·30 Africa South, Agulhas Cape to Mossel bay. Various authorities. 1867. 2s. 6d.

932. $\frac{DE}{2}m$ = various Java island, its Harbours and Anchorages. Dutch Survey. 1867. 1s. 6d.

16. $\frac{DE}{2}m$ = 1·0 China inland Sea, Hioga and Oösaka. Commander Bullock, R.N. 1867. 1s. 6d.

861. DEM = 1·7 Russian Tartary, Sheet 1, Amur river from entrance to Tehnurrak point. 1864. 2s. 6d.

862. DEM = 1·7, Russian Tartary, Sheet 2, Amur river from Tehnurrak point to Grand Duke Alexander islands. 1864. 2s. 6d.

EDWARD DUNSTERVILLE, *Commander, R.N.*

Hydrographic Office, Admiralty, 15th September, 1867.

THE
NAUTICAL MAGAZINE

AND

Naval Chronicle.

DECEMBER, 1867.

PORTSMOUTH AND ITS DEFENCES.

THE defences of Portsmouth in days gone by, were her wooden walls, but in days to come are to be those of iron ; and whether afloat or on shore, seems not yet to be decided. Eternal, endless change, like fashion, rules the day ; and experience tells us we must bow to the decrees of fate. There too is that busy, bustling element, called steam, almost making soldiers believe themselves sailors, and with smooth water in " the stilly night," hinting to us that we must be on the *qui vive*, lest in the event of sudden war, a dash be made at our vulnerable, or what we have been induced to believe are our invulnerable points, and the pride of John Bull in his old sea walls, the navy, be scattered to the winds. Therefore it is that the defences of Portsmouth must always concern us. Its very waters are sacred ; every part of its shores remind us of former years—aye, when England was fighting for her very existence among the nations ; and sacred they should be still, whether her sea walls (for those are they on which she has been most disposed to meet her foes) be composed of wood or iron. Nor should there be any trifling with their principal home ; unchangeable, that has remained through centuries, when let alone. But amid the ever changing fashions of the day, Portsmouth has not been exempted, and it remains to be seen whether the harbour of our first naval arsenal, will come as harmless out of the hands of modern governments, as it did out of those of former days.

Yes, as time rolls on, so comes change—change which has at length revolutionized the fleet. Under the kindly influence of peace, our friends on the other side of the Atlantic have not been slow to tell us what they have done ; and how, by means of as complete a transformation as was ever made within so short a period, in a ship of war,

they have come off victorious in the war of the rebellion. And if they have taken the pains to make no secret of their change, shall we not timely discern the formidable nature of the ships by which we too should be assailed, should unhappily a war arise on some future day. Their change has not been confined merely from wood to iron; it has been far more important even than that. The moderate sized gun of former days has been replaced by a monster, and that in a kind of ship, which, say what we may, will be hard to *see* above water. Let us hope however, that, nations are learning wisdom as well as warfare: the former profiteth, while the latter impoverisheth. Let us therefore, look at war as a necessity of the past; be earnest in our endeavours to keep it from our shores; not forgetting that on some future day it still might reach us, taking for our motto "*cura quietem*," in order that should it come we may not be found asleep.

One of our principal cares in such a case are the defences of Portsmouth. They form a serious item in our annual expenses, and well they may do so, when the efficiency of our first naval arsenal is at stake. And those defences extend over a huge area of flood and field, that is actually under the range of the monster guns of these days. Three miles has been considered about the effective range of our naval artillery; but, from the defences of Portsmouth six miles would be required to reach Spithead! So soon as these defences were pronounced necessary, their cost, however great, would vanish in comparison with their object. But by a statement which has recently appeared in *The Times*, a serious defect has been allowed to creep into them; and which the sooner it is rectified the better, for sooner or later rectified it must be.

Portsmouth as all the world knows stands on an island, formed on one side by the sea, and on the other by the waters of its own harbour and those of Langstone, connected together by a creek, of no further use as yet, but as admitting, at a certain time of tide, the waters of Langstone flowing through it into Portsmouth Harbour. But in the course of the construction of these fortifications, it seems to have been *intended* (and we purposely italicise the word) that there should be a *bona fide* channel made of this creek, for the passage of gun-vessels between the two harbours. The dimensions of this channel are referred to in the statement from the *Times*, so that we need not repeat it here; and its purpose was of course to contribute towards the defence of Portsmouth, as were the fortifications themselves.

It appears by the statement which we print *in extenso*, that the fortifications are drawing towards their completion, but of the enlargement of this creek for its *intended* purpose, nothing appears from which we can gather more than that it remains *in statu quo antes*, or perhaps in other words untouched.

There can be no doubt that to make such a channel as that which was required, implied a very considerable outlay—one which would make a large addition even to the work of constructing long lines of fortification. The enlarging and deepening this channel would, no doubt, require coffer dams at Langstone as well as at the Portsmouth

end of it, to keep the tidal water from the works. Still it appears by paragraph 9, in the statement from the *Times*, that, this work was to have been done, as well as that of the ramparts; and there is more than one reason why this is really as important as the fortifications themselves.

Portsmouth Harbour, quiet as it has been nearly ever since it owned the name, is at length to verify the principle of change, which has been growing every where! It has been condemned to contribute to the enlargement of its dockyard; an extension of ground is required for this, which must be taken from that. Now to take ground from Portsmouth Harbour, is virtually to rob that harbour of so much tidal water, which means that tidal water can no longer occupy it as it did. But tidal water has been held as essential to keeping down the bar of that harbour, and a high authority now passed away, has declared that every "cup" of water that flows with the tide into Portsmouth Harbour has its value. And in order to contribute as much tidal water as was thus to be taken away, by adding ground to the dockyard, Langstone Harbour was looked to for it, and hence the importance of a channel for it to flow through from Langstone to Portsmouth. Such a condition of affairs between the two harbours, perhaps, little concerned those who have been constructing the works of the fortifications, but it is a vital matter to the efficiency, and even to the existence itself of Portsmouth Harbour.

Recourse has been had to the dredge, for the purpose of keeping down the bar, which dredge has been freely used of late years. But there are high naval authorities in these matters whose opinions our pages contain, that are by no means favourable to the opinion of that bar ever remaining in the quiet condition which it shewed before it was invaded by this dredge. It has evidently been of late years and even now is in an unquiet condition, according to the hydrographic notices that have been issued concerning it. And if the mere disturbance of it has produced this effect, what will that be which robs the harbour-stream ebb of its only means of keeping down that bar?—when the amount of that tidal stream is diminished by the encroachment of the dockyard, and is even lessened still more by not getting its due amount of tidal water that was to have been replaced from Langstone.

Would it not have been far better to have let Portsmouth alone in its long rest and to have adopted the proposal of Admiral Sheringham, by transferring all our steam to the Hamble for the sake of room, instead of denying it tidal water to enlarge the dockyard, as he advised the Hydrographer to the Admiralty in 1861, in his letter, printed in our Volume for 1864. We are, at all events, not alone in believing so.

But we will now make room for the statement of the *Times*, and give it seriatim as so important a subject deserves.

1. If the opinions of the officers of our own Royal Engineers, from Sir John Burgoyne down to the youngest officer, were taken with regard to the triple lines of fortifications now rising up in bristling array around the dockyard and naval arsenal at Portsmouth, with their advance guards at the east and west ends of the Isle of Wight, it is

more than probable that the majority would pronounce all the works as perfect as human skill or foresight, under the circumstances of their design and construction, could possibly render them. Still many of our Engineer officers hold contrary opinions, and contend, in common with many military men and civil engineers, that scarcely a work can be inspected, finished or in the course of construction, that does not exhibit some fatal defect, either original in design, or arising out of the conditions of its construction.

2. No other nation has certainly in times of peace entered upon a work of such magnitude as in the great scheme for the "Defence of the Dockyards and Naval Arsenals." The work is vast if the failures have been pretty numerous. It is better for our strength, however, to discover and point out all such defects as may exist ourselves than to allow our foreign friends (who are constantly and wonderfully inquisitive in the matter) to point them out for our special edification, and thus lead them to suppose that the people of this country are content to repose in fancied security upon a false estimate of the country's defensive power in the shape of its coast and harbour fortifications.

3. It would also be as well to confess at once that even up to the present moment we have nothing as the fruits of military engineering of which we can very loudly boast, or that is likely to excite the admiration of our American brethren, or of our many friends from the Continent of Europe, unless, indeed, it is the magnificent way in which we spend our money on such matters, the "eccentricity" with which we make many of our greatest works look uncommonly like failures, and the incomparable coolness with which we do all these things. It is certainly impressive enough to take one's stand on the highest point of the crest of Portsdown-hill and look downwards to the south, the west, and the east, over scores of square miles of land and water which are being covered with forts of every size, description, colour, and material, red, white, green, brown, and grey; iron, granite, clay, chalk, and sand—a grand school for the education and practice of the Royal Engineers. In all this vast plan the Portsdown-hill forts and the marine forts at Spithead have naturally outweighed all others in general interest, and will continue to do so from their extent and peculiarities of position. Let the reader, in imagination, step with us on the highest elevation of Portsdown, in the centre of the line of the five gigantic forts which are ranged along the seven miles' length of the crest of Portsdown.

4. Now, if we can only give, for the time, unlimited faith to the professional skill and provisions of the great department in Pall Mall that designed those works, and in its subordinate officers who carried out the details of their construction, we should find Widley, Southwick, Nelson, Wallingford, and Purbrook assume an appearance of grandeur, strength, and efficiency that should last for ages, as they stand in their elevated solitude with their backs turned upon Portsmouth dockyard and arsenal, and their empty embrasures looking towards London. If, however, we lay down this faith on the glacis of these forts, and look

boldly down into their deep white ditches, their empty embrasures, or over their grass-covered ramparts, reminiscences will arise of main magazines collapsing 50 feet below the level of finished parade grounds, of escarp walls falling down into and filling up the ditch, of retaining walls giving way from excess of weight behind them, of arches and vaulted passages in brickwork split and gaping under superincumbent and miscalculated weights, and a thousand other "eccentricities" of the kind. But, as we have already observed, the work has been vast if the mistakes or failures have been pretty numerous. As a rule also, all the mistakes, or nearly all, which have occurred, have been due to circumstances under the control of the officer in local charge rather than to the heads of the Engineer department at the War-office; or, to the immense progress made in the manufacture and calibre of rifled artillery since these and all other works around Portsmouth were designed. There is also certainly nothing on the heights of Portsdown nor in any part of the triple bands of fortification that stretch out from its base which can be said to exhibit such a miserable fiasco as may be seen on the banks of the Medway.

5. "The Portsdown forts," Colonel Jervois remarks, in referring to objections that have been raised to their construction, "render it impossible for an enemy who may have landed on the coast of Sussex to seize the hill by any force detached from his main body without a regular siege." To this it may be replied that no enemy must ever be allowed to land in England. He must be met on the beach and driven back into the sea he has ventured to cross. Too much has been made of Portsdown-hill, but as the work is nearly done it is useless to grumble too persistently over the £600,000 it will have cost. Southwick, Widley, and Nelson, the three forts holding the central position of Portsdown, and which loom up so grandly in their elevated seat 600ft. above sea level, are complete so far as their construction by the contractor is concerned; but the Artillery Department have yet to lay the "racers" on the gun-platforms on the *terre-plein* and in the *caponnières*, and supply the guns and mortars for their armament. These three works may be generally described as earthworks of extraordinary size and horse-shoe form, with deep and wide ditches cut in the chalk, and flanked by weak *caponnières*.

6. The front of each work, or the toe of the horseshoe, faces north, the heel of the shoe, or gorge of the work, being on the south face of the hill, and toward Portsmouth. The gorge is closed by massively built barracks in brickwork, with stone dressings. From the edge of the huge chalk ditches down to the long and deep valley north of the position the entire face of the hill has been cleared of all timber or hedgerows, and all inequalities in the ground levelled, so that it now forms a vast glacis swept in all directions by the fire of the forts. From the valley below, in which lie embosomed in foliage the villages of Purbrook, Southwick, and Waterloo, the ground gradually rises in a succession of swells, mostly well covered with timber, until it culminates in the far distance in lofty spurs from the great range of downs which extends along the coast of Sussex.

7. So far we have seen the central strength of the great position of Portsdown. We have now only to glance at the east and west ends. On the eastern end of the hill stands Fort Purbrook, with its two extensive outworks—a lion couchant, keeping watch over the low-lying land below and the great eastern highway leading towards Chichester and Brighton. Purbrook is very similar in form to the three central forts, only differing in its two outworks, which embrace the north-east and east slopes of the hill. It is still in course of construction. Fort Wallington, on the west end of Portsdown, and overlooking the slope of the hill to the N.W., is partly built on clay, and has revetments of massive brickwork on the escarps and counterscarps. It is complete with the exception of its armament. Fareham Fort is separated by the village of Fareham from the west base of Portsdown, but it is part of the Portsdown line of defence, commanding as it does the approaches to the hill in the advance of any enemy from the westward or the Solent. It is an earthwork, with bomb-proof brick casemates under the ramparts. The armament of all the Portsdown forts is intended to comprise a total number of about 200 heavy guns and mortars, besides light pieces for the *caponnière*. These guns may possibly be all mounted in the forts in about two years' time—October, 1869—if the authorities bestir themselves in the matter with requisite energy.

8. Looking south from Portsdown, and in the direction of Portsmouth, may be seen at the very foot of the hill, with only the village of Cosham intervening, the northern section of the second circle of fortifications, as Portsdown is the northern section of its first or outer circle, which engirdles Portsmouth—the Hilsea lines, defending the only entrance to the island of Portsea by road from the mainland. The Hilsea lines have been uncommonly fruitful in their crop of "eccentricities." These lines are nearly 3,000 yards in length, and their right may be seen resting on the mudlands of Langstone harbour and their left on the mudlands of Portsmouth harbour. They consist of long earthwork curtains, with casemated batteries on the flanks of each curtain, the batteries intended to cross fire with each other, and sweep the whole front of the work. There are embrasures for 90 guns.

9. The channel between Portsmouth and Langstone harbours, connecting the two tidal waters, runs in front of the lines, and an inner moat separates this tidal channel, in which a certain depth of water is to be retained at all times of tide, from the base of the line of ramp. A new road has also been constructed for the use of the public entering or leaving the island from the mainland, which is to supersede the old highway, and the outer tidal water channel was to have been so designed, to use the exact words made use of in Colonel Jervois's report on the "progress made in the construction of the fortifications for the protection of the dockyard and the naval arsenals," dated February, 1867, "to give it sufficient dimensions to allow of the passage of floating batteries." The Hilsea lines have become a sand-covered ruin, with their casemates cracked and tottering over quaking bog and permeating chalk springs. The embrasures are choked with the falling earth intended to cover the brick face of the casemates on the flanks,

and the revetment walls throughout are kept in their places by an elaborate system of timber shoring.

10. The work of construction has been for years in hand, and successive contractors have been driven from it by ruin or despair; but still the locomotive with its long train of earth trucks may be seen toiling upwards and along the line of rampart depositing its earth coverings. The difficulties met with in the construction of this line of defence have been immense, but in time they will no doubt be finally overcome and the work finished. The embrasures have all been placed so closely together, however, that every alternate one must be built up, and thus the Hilsea lines will only mount one-half the number of guns for which they were designed. No one imagines it possible that Hilsea lines will ever be subjected to an attack by an enemy, and, therefore, in common with the huge forts on Portsdown, possibly, it can matter but very little whether guns are placed on them or not.

11. The eccentricities of the Hilsea lines, which appear to be of the greatest public importance at the present moment, relate to the construction of the new public highway, and the tidal channel connecting the waters of Portsmouth and Langstone harbours. The new highway has been carried by the Royal Engineers over the tidal channel referred to by a bridge, moving over central wheels by double rails, of such restricted dimensions that the local authorities—the Sheet Bridge Highway Trust—refuse to accept it, and a new bridge must therefore be constructed at the expense of the Government.

12. The tidal channel is a still more serious matter. When the Hilsea lines at present being constructed on the south bank of the tidal channel were first designed at the War-office, to supersede the old bit of fortification then standing there, the Admiralty communicated with the War-office, and desired that in any future alteration of the old tidal channel the width of the tidal water at high-water mark should not be less than 300 feet, that two openings for the passage of war vessels should be available in any new bridge, and that the tidal channel should be made of sufficient depth and width to admit of the passage through from Portsmouth to Langstone harbour, or *vice versa*, of floating batteries and gun vessels to assist in the defence of the island.

13. The Admiralty authorities also called special attention to the fact that in their taking a large amount of water space from Portsmouth harbour for the extension of the dockyard there would very probably be a corresponding decrease in the total volume of tidal water in the harbour, which must be restored by other adopted means; that those means existed in the known flow of the tide from Langstone into Portsmouth harbour for two hours after the tide had made its ebb from the mouth of the latter; and that to secure the full benefit of this additional flood into Portsmouth harbour, it was imperative that the new tidal channel should be of sufficient width and depth, and that retaining gates should be fixed at the Langstone end of the channel to prevent any back-flow of the tide. It was also of the highest importance that the "scour" of the ebb tide should not be

lessened out of Portsmouth harbour under any circumstances, but rather increased, owing to the existence of two immense banks of shingle formed inside the harbour itself, and the known deposit of shingle on the Channel "bar" outside the harbour.

14. The very existence of Portsmouth as a naval port, therefore, seemed to depend upon the Royal Engineer Department constructing the new tidal channel in good faith with the expressed wishes of the Admiralty, but the work now stands on the verge of completion, with the important suggestions of the Admiralty ignored in every important particular. Instead of the channel giving a water way of 300 feet in width at high-water mark, with a depth sufficient for floating batteries and gun-vessels and a double passage under the bridge, it has now a breadth of water of only about 120 ft., has not a depth of water sufficient for the passage of such vessels, and only one available passage between the piers of the bridge, and will afford no material tidal addition to the ebb of Portsmouth harbour. Some correspondence has naturally ensued upon this matter between the Admiralty and the War Department, which has been so far closed by the latter, stating that the new tidal channel served all the purposes required of it for the strength and security of the fortifications, and that if the Admiralty desired a deeper or wider channel than the one made, the Admiralty could obtain a fresh estimate and do the work by its own officers! If we did not happen to know that the facts connected with the construction of this bit of water channel are just as we have related them, we should look upon them as far too absurd in their nature to deserve a moment's credit.

15. Leaving Hilesea lines at our feet, and looking out further to the southward, we can trace the sweep of the three lines of defence, until the eye rests upon the stagings and stone foundations for the marine forts at Spithead, or further still upon the great mound of earthworks on the summit of Bembridge-down, which forms the "keep" to the various forts on Sandown cliffs and sands, and commands the approaches to its beautiful bay with the anchorage inside the east end of the Wight at St. Helen's. The Spithead works, however, from their paramount importance and their present backward stage of progress, are of greater interest than any or all the others at the present moment. The "Horse" and "Noman" shoal forts will be the largest, and they will also be the most successful in their work of construction of the Spithead forts. The Horse fort has the base ring of its foundations standing on the shoal at 11ft. below low water of ordinary spring tides. The Noman has its base ring 20ft. below low water of ordinary spring tides. The foundations of each are formed of rings of granite, Portland, Runcorn, and concrete blocks, the rings decreasing in diameter as the foundation grows in height. The interior space of this layer of rings, in the centre of which an iron cylinder has been sunk from 50 to 60ft., and remains available for future borings for water, is filled in with concrete. The top of both the foundations for these two forts thus form a circular and solid base, on which the future fort must be built, 210ft.

in diameter. On this base all that is yet being done towards the construction of the forts themselves is building up their basement wall each 16ft. in height above the foundation summit, and 14ft. 6in. thick, of granite and Roach Portland stone. These walls are set back from the edge of the foundations 18in., to admit of a facing of armour-plating being given to it. The top of these walls will be level with the interior of the work on the floor of the lower gun battery. They will inclose the magazines, shell stores, provision stores, water tanks, etc.

16. The Spithead forts were at first intended to be of stone alone. Soon afterwards a granite structure faced with iron was adopted, but subsequent experiments at Shoebury demonstrating the inability of such a structure to receive the impact of heavy shots, without shaking its "heart" into fragments, the idea of a fort built up entirely of iron was entertained. This latter alternative, however, frightened every one by its evident excessive costliness, and the present adopted and somewhat composite plan was at length substituted. The forts are now to have an outer casing of 15in. of iron plating resting upon a simple system of longitudinal and transverse iron girders filled in with stone and concrete, and having an inner lining or skin of iron plating of about an inch in thickness. There will be two tiers of embrasures for 18-ton guns round the fort, and the latter will be capped by four turrets, each in the form of a truncated cone, constructed on plans proposed by Captain Steward, R.E., resting on brickwork piers, built up from the fort foundations and, therefore, independent of any support from the fort itself. Each turret is intended to carry two 23-ton guns. In the rear of each of the two circles of guns which are to look through the embrasures of the forts are the living rooms of the garrison. Traverses will be built up between each gun in masses of concrete, enclosed in iron-plate casings. Each fort will mount fifty-five 18-ton guns in the two circles or casemates, besides the eight in the four turrets.

17. The objectionable features in the plans for these forts appear to be an unavoidable weakness in their structure, owing to their composite character and the number of openings in their sides, the limited power of their armament, and their incapability for reconstruction or investing with greater strength, of either offence or defence, at any future time. Models of these forts are now lying at the War-office, but it is not improbable that even now great alterations may be made before the forts are built from them. It must always be allowed that if these forts are ever attacked by an enemy it will be with special craft, carrying not 18, but very probably 50 to 60-ton guns. To make the forts of real service in any possible wars to come upon us in the future, they should be so built that we could remove their armament and replace it with weapons of greater power as science progressed onwards in their manufacture. With bare room for mounting 18-ton guns, the Spithead forts become degenerated to torpedo stations, with their guns only of service to protect the nests of mines which may lie hidden in the waters of the deep channels which wash their base.

18. The Spithead plan of marine forts is made up with three others in conjunction with the Horse and Noman—the Spit Shoal, the Ryde Sand, and the St. Helen's Spit. The Spit fort foundations stand on firm gravel at 20 feet below low water and spring tides; the diameter of the base ring at high-water level will be 151 feet. It will carry 17 guns in casemates, 13 of which firing seawards will be protected by armour plating, and will be 18 tons each. Four firing in the rear of the fort are to have iron shields. Two turrets on Captain Steward's plan are to surmount the work and carry 23-ton guns. This work with Southsea Castle stands at the outer entrance to Portsmouth Harbour Channel. The fort to be erected on the Ryde Sand will be similar in character. The foundations of both are only as yet in process of construction. The fort at St. Helen's which is the outermost of all the marine works at and around Spithead, is intended to mount 15 guns in casemates, but a serious difficulty has been met with in constructing the foundations which delays the work. The site of the foundations lies in a very exposed position, and to make it as secure as possible a ring of iron caissons filled with concrete and brickwork in cement has been sunk 23ft. into the shoal outside the perimeter of the fort. The sand within this ring has been dredged out and filled with concrete. It is this ring of caissons which is now reported to be giving way to the action of the sea and the battering force of the shingle in heavy gales bursting on the point.

19. Southsea Castle is another of the works bordering upon the anchorage of Spithead, which the sea, in the fury of its south-east gales, is threatening to root up and destroy. It holds, with the marine fort on the Spit Sand, almost within speaking distance, a firm grip upon the throat of the entrance of the narrow channel under Southsea beach, which leads from Spithead to the entrance of Portsmouth harbour, and no ship or floating battery ought ever to swim past and between the fire of their guns. Southsea is massive open earthworks, with the embrasures prepared for iron shields. The old stone built castle in the centre is to be fitted with guns behind iron shields, and 13-inch mortars will throw their shells to Spithead from the rear of the earthworks. Twenty-two of the heaviest rifled guns will be mounted on the earthworks. The other supporting defensive works around Spithead anchorage are Lumps and Eastney batteries, the Puckpool mortar battery on the island shore, about a mile east of Ryde, and the granite fronted semicircular fort (for iron shields) building on the Gilkicker Point. The former is built, and is now receiving thirty-eight sea-service 13-inch mortars.

20. The value of a vertical fire in any defence of Spithead can scarcely be over estimated, but the Puckpool battery must be armed with a more scientific, reliable, and farther reaching weapon than the "obsolete" 13-inch iron pot, before it can be hoped to inflict any certain damage upon steam war ships rushing to and fro at Spithead, and all out of present mortar range. Gilkicker Fort is an imposing enough looking structure, with its grand outline of massive granite arches, although it has yet to be fitted with its iron shields. It will

mount twenty-seven heavy guns in its iron shields, and 16 13-inch sea service mortars in the rear. As a composite work of granite and iron it would offer but a poor defence against such floating iron citadels as would inevitably be brought against it by such an antagonist as France in time of war. It is also very contracted in its dimensions, the utmost amount of training for the 22-ton gun being 20 degrees.

21. There were other works to be seen by the Duke of Cambridge during his inspection of the troops and fortifications in the South-West District and around Portsmouth, including the heavy iron shielded works at Hurst Castle, the Cliffend, Warden, Hatherwood, and other batteries at the Needles passage, with the Golden-hill fortress and general keep for the western end of the Isle of Wight, and the works on other parts of the island, all designed for the defence of the great dockyard and arsenal at Portsmouth from the incendiary schemes of any possible future enemy. A large amount of these provisions for the insurance of our chief naval establishment has already been effected, although very much, as we have endeavoured to show, yet remains to be done. Vast sums of money have been and are being expended, and with the commission of a goodly number of "eccentricities," we have, at all events, the satisfaction of knowing that, with even the excessive stupidity displayed in some of them, they form but a certain amount of percentage on the gross amount of work done.

A WORD ABOUT THE AURORA BOREALIS.

How often on a fine, clear night in the broad Atlantic, as well as in North America, have I been delighted with the fanciful corruscations of the Aurora, while wondering at the interesting display of its phenomena, and speculating on their cause. Similar feelings to my own, and perhaps similar ideas concerning its origin have been shared by many a navigator, in ancient as well as modern times; and yet up to the present day, the origin, or cause, of this beautiful phenomenon is unknown. It is said that observations are not yet sufficient to enable the man of science to trace it to its source, and perhaps the following addition to the store may be worthy of record in the *Nautical*.

During the last four years my pursuits have placed me in very favourable positions for observing its fantastic appearances, having been constantly crossing the Atlantic in winter and summer, and I have been thus enabled to witness the Aurora as far south as the 40th parallel of north latitude.

It is perhaps owing to the foggy nature of the atmosphere in England that it is seldom seen in all its brilliancy in that country; but on the north coast of Scotland, and beyond it to the northward, its

corruscations in all their beauty are observed. About as far south as the above parallel, the corruscations are seldom perceptible, the centre of the main body of light alone expanding and contracting at irregular intervals. In August, 1867, the phenomenon was observed by me under singular circumstances. The ship in which I was employed was anchored in a deep estuary of Nova Scotia, one evening; its pine covered hills reached down to the shore on either side of the ship, within a few hundred yards of her. About a mile from her the estuary opened out into a large basin five miles in length. The weather during the day had been fine and clear, but about an hour after sunset, one of those dense fogs, so frequent on that coast, settled over the hills, leaving the water as clear as before, along with a few feet of the base of the hills.

At nine o'clock in the evening the whole surface of the estuary was imperceptibly lighted up, until it shone with a brilliancy as considerable as that of the moon. Indeed had our satellite been rolled out (to speak metaphorically) and as a sheet of thin bright metal been spread over the water, the effect could not have been more beautiful than that which was really produced. Far in the distance, were distinctly visible, the sails of the small country boats glistening, as they would have done under moonlight. The dark green foliage of the firs formed no inapt frame for such a glorious picture; and only a few among those who were present could believe that the beautiful scene before them was the effect of the reflected light of the Aurora. Fortunately however for them, in about half an hour the fog lifted as suddenly as it had come, and the sky in the northern quarter was seen brilliantly illuminated.

Let me now add my own speculations and the conclusions at which I have arrived, from this as well as other appearances of the mysterious Aurora. The first is, that about thirty-six hours after it appears the wind invariably blows hard from the south or south-west. Mariners should therefore be on their guard for this effect of its appearance. Secondly, it is evident that the Aurora must be caused by some disturbance in the atmosphere in the vicinity of the pole, and that a rush is made by a column of it from the *south*, to fill up the gap caused by combustion or otherwise. A fact which I have noticed elsewhere, in the course of my voyages, strongly confirms this theory—viz., that of the southerly wind following in about thirty-six hours after the Aurora has been observed in the 45th parallel of latitude.

I have traced the wind for six hundred miles after the last gale of the beginning of August, and found it everywhere S.S.W. to S.W., or nearly true south; hence it would appear to me that these Auroras perform an important part in regulating our winds. Nothing in this globe of ours is created without design, and it is not reasonable to suppose, that this beautiful phenomenon was called into existence solely to light up the snow-clad wilderness of the north. Again, who shall say how far the system of aerolites is connected with the Aurora? It seems more reasonable to suppose that they owe their origin to causes in connection with our planet, than that they should break away

from the laws of gravity in another. If the latter theory be correct we ought to expect bodies expelled from mountains to fall to the earth occasionally.

W. W. KIDDLE, *Navigating Lieutenant*.

We reprint the following from one of our former volumes, 1848, from a meeting of the British Association, as it will interest our correspondent:—

As the trade winds are caused by the denser air from the polar regions to the tropics, the superior trade winds in the higher regions of the air must be from the tropical to the coldest parts of the earth, to keep up the equilibrium of the air. Then, as it is proved by Forckhammer, that more vapour rises from tropical seas than falls there, and that more falls in polar regions than rises in those parts; and as it is proved by the experiments of Volta and others, that whenever evaporation takes place positive electricity is carried off—it follows that there are electrical currents similar to the currents of the air, the vapour with its electricity rising in the tropics (thus rendering those parts negatively charged) is carried thence by the *superior* trade winds to the colder parts of the earth, where the vapour falls; and its electricity escaping to the earth, renders those parts positively charged, whence the electricity rushed off along the earth's surface towards the more negative parts of the earth, and is again carried off by the rising vapour. Mr. Rowell ascribes the direction of the needle, to those currents of electricity from the positive to the negative parts of the earth, and the Aurora to the interruption of those currents of electricity, by the dry and non-conducting state of the air in the *frigid regions* during *severe frosts* insulating the electricity of the clouds, where it accumulates till it flashes back through the higher and rarer air towards the more temperate regions thus exhibiting the aurora, and at the same time causing a disturbance of the magnetic needle. The author thinks that many writers have fallen into error in supposing the height of the Aurora to be far above the limits of our atmosphere, which error may have arisen from some mistake in their observations or from some other luminous meteor being mistaken for the Aurora, for as the observations of Parry, Franklin, Richardson, and others distinctly prove that the Aurora does take place near the surface of the earth, and is in some way connected with the formation of clouds, the arches which are sometimes seen at such great altitudes may arise from totally different causes. He considers that the diurnal variation of the needle tells in favour of the opinion that the direction of the needle is dependent on evaporation; as very early in the morning, when to the eastward of our meridian, evaporation must be at a minimum, the declination is least: the declination then *increases* till about the time when the evaporation must be most rapid, and then decreases, till in the evening it reaches its medium position; and the fact that the diurnal variation is more than double in summer what it is in winter, tells in favour of this view.

The cause of magnetic poles in this hemisphere he ascribes to the

quantities of ice blocked up both in winter and summer in the high latitudes above the two continents, thus causing those parts to be the coldest in this hemisphere, and therefore the negative poles, for, as the density of the air from the frigid regions is the cause of the trade winds, and as the density of the air intervenes with the degree of cold, it follows that more air must flow from the coldest parts of the earth towards the warmer regions than from any other parts, and consequently, there must be the greater flow of the *superior currents* of air from the warmer to those colder parts, thus bringing more vapour and electricity there than to any other parts in this hemisphere. Now if the greatest degree of cold be at the pole of the earth, and evaporation increased regularly thence to the equator, there would then be no declination of the needle, as the electricity would pass off from the coldest or positive parts towards the more negative parts of the earth in the direct lines of longitude; but as the magnetic poles are at a distance from the terrestrial pole, and as those parts are more positively charged with electricity than other parts in the same latitude, the electricity must diverge eastward and westward of the direct lines of longitude in passing off to the more negative parts of the earth, and thus cause the declination of the needle.

The author contends that the fact that the Aurora did not affect the needle at Port Bowen in 73° N. lat., while it had great effect at Port Franklin in 65° N., tells in favour of his views, that the direction of the needle is owing to the currents of electricity from the magnetic pole to the more negative parts of the earth, as the American magnetic pole is in 70° N.

Mr. Rowell exhibited a large diagram of the earth, from the north pole to 40° N. lat., shewing at one view the situation of the American magnetic pole according to Sir James Ross, and the Siberian pole according to Hansteen, the lines of equal intensity from Col. Labine's maps, the lines of equal temperature from Humboldt, the directions of the needle shewn by arrows, etc. By the diagram he showed that in the meridian of the American pole, the lines of equal temperature to be much lower latitude than in any part of this hemisphere, which he ascribed to the polar seas there being land locked, and causing a great accumulation of ice in those regions, both winter and summer, whilst the magnetic force, also, is the greatest in that meridian.

In the meridian of the Siberian pole, the polar sea is far more open, the temperature is higher, and the magnetic intensity less. In the neighbourhood of Behring's Straits where the Polar Sea is open to the Pacific Ocean the intensity is still less, but in the meridian of London, or rather to the east of it, the line of equal temperature rises to a much higher latitude than in any other part of this hemisphere, the intensity of magnetism is the least, and the Polar Sea is there open from Greenland to Nova Zembla, and the ice formed in those regions is liable at all times to be broken up and dispersed by the storms of the Atlantic Ocean. He considers the magnetic poles not to be mere points in the earth, but extensive districts in the coldest parts, and that even mountains, which from their elevation, are continually con-

ducting electricity from the highest regions of the air, must have some local effect on the needle. He contends that the opinion is erroneous which ascribes the changes of declination to a rotation of the magnetic poles round the pole of the earth, as we have no proof that the magnetic poles in this hemisphere were ever situated otherwise than in the high latitudes above the two continents, and that the change of declination may be fairly explained on the supposition that the American pole has *increased* in strength, or the Siberian pole has *decreased* in strength, and that the line of no variation where the influences of the two poles are equal, has receded during the last two centuries from some point west of England to its present position eastward of St. Petersburg, thus bringing parts which formerly had an eastward variation to be under the influence of the American pole. He suggests that any geological change which has made the Siberian Polar Sea more open would tend to weaken that magnetic pole, or any change that may have blocked up the American Polar Sea would increase the strength of that pole. He concludes by again suggesting the experiment of raising electrical conductors, to the height of the clouds in the frigid regions during severe frosts, which he believes would cause the Aurora, and also throw some light on terrestrial magnetism.

CONSIDERATIONS of the winds, currents, and tides of the Gulf of Cadiz, and the Western Shore of the Spanish Peninsula, with the best points for making the coast from sea, and how it should be navigated.

(Continued from page 609.)

Currents on the Western Coast of the Peninsula.—On the Western shore of the Peninsula the currents are strong, and in its immediate neighbourhood run from South to North, and North to South according to the prevailing wind. But in the offing they incline to the N.E. or S.E. according as the wind may be S.W. or N.W. Against these on-shore winds vessels must therefore take precaution, for if the S.W. wind is blowing, or even the N.W. also, the vessel will drift to the shore. Experience has shewn that allowance must be made for drift by steering more westerly courses than the lay of the coast would require to keep clear of it especially when it is blowing hard.

Currents previous to the wind. It is observed on the coast of Galicia, and the same would naturally occur on the coast of Portugal that, on one or even two days previous to a gale, the current sets towards that point of the horizon from which it will eventually come; that is when the current sets to the South without any apparent cause the Vendaval will come in a gale, and a similar result follows when the current sets to the North. So that the fishermen who have most to do with

allowing for currents know very well by them when a N.E. or S.W. wind is about to set in.

Strength of Currents on the Western Coast of the Peninsula.—The current generally produced by the wind, sets to the N.E. and North, when that is from any point between South and West, and it sets to the South when the wind is any where between West and East from the northward. In winter the current sets mostly from some point between North and East, and in summer from some one between North and West, and its hourly rate is about two miles, and even more with a strong Vendaval.

The navigator who finds himself off Cape Finisterre with a Vendaval to beat against must be careful of the shore in bad weather, for he will be drifted insensibly to leeward until he has passed Cape Prior.

With respect to ships off Cape St. Vincent, bound towards Cape Finisterre with fresh N.E. winds they will find enough to do, to overcome the current they will meet with along the coast. And with fresh N.W. or S.W. winds there is also a rise in the level of the sea, in all the Estuaries and ports of the Peninsula, the reverse of what takes place at Cadiz and in the Bay of Biscay with N.E. winds.

Tides.—This phenomenon preserves all its regularity on the shores of which we are treating, and a supplement of waters as the pilots call it, can only be observed when N.W. winds prevail. That is when the said winds prevail, a large mass of waters is accumulated in Cadiz Bay, and every high water rises above the usual level, and makes the time of high water later. The same occurs on the Coast of Portugal and Galicia, and this delay in the time of high water and increase in the rise of the tide becomes greater the further it is to the northward.

Propagation of the Tidal Wave.—The tidal wave of flood, as it flows from South to North in the Atlantic Ocean, naturally enters the Bay of Cadiz before it reaches the Portuguese Coast as well as that of Galicia. This progress of the waters originates a current called tide, which on the African coast spreads itself according to its configuration, that is from S.W. to N.E.; in that of Cadiz from South to North, inclining to the N.W. according to the trend of the coast, and finishes by running to the West on the Coast of Algarve, doubling Cape St. Vincent, from whence it takes a northerly direction along the Coast of the Peninsula. All this takes place on the flood, for on the ebb the water retraces the above course in the opposite direction, and the various currents it forms also assume the opposite directions.

The current of tide runs only at a short distance from the shore, and only surpasses this distance at the heads of the tides.

The general currents above described in no way interfere with this singular phenomenon and only tend to increase or diminish its current when favourable or unfavourable.

Equinoctial Tides.—When the high water of sizigy happens near the vernal equinox (March) and a heavy Vendaval is blowing, so considerable a rise of tide takes place in the bays and ports, that the jetties and the low lands about the shore are inundated, and sometimes considerable damage is done. At Cadiz not only are the highest parts of

the sides of the jetties whitened by the foam, but the sea also threatens the very walls of the city. The current of the flood is more or less increased in such cases and the tidal establishment of the port is delayed.

Tides in the Mediterranean and Gibraltar Strait.—With respect to tides of the Strait we have already noted what takes place, and we will record here some facts in corroboration of it. It is generally considered that the Mediterranean has its peculiar tides. But this conclusion is not altogether sufficient. A portion of its waters, particularly that between the meridians of Capes de Gat and Trafalgar, is entirely obedient to the luni-solar influence, following the prescribed course, and is lost in the West by becoming mingled with the great tidal wave of the ocean in its course from South to North. This portion increases until it attains the height of twelve feet at the times of the sizigies, and this difference of level remains established as we have already observed.

When this takes place, two currents are produced on both the shores of the Mediterranean towards the West, or rather perhaps against the general current to the eastward. The coasting vessels which avail themselves of this current to get through the Straits against westerly winds, trip their anchors when the moon appears in the horizon, for then it is that the tide begins to raise the level of the waters.

During the ebb the tidal wave follows the reverse order, taking its course in the ocean from North to South, and in the Strait and part of the Mediterranean from West to East, but gradually decreasing in this sea and vanishing after passing the meridian of Malaga, and these phenomena are reproduced off the middle of that headland.

The failure of the Mediterranean tides is attributed to the extreme narrowness of the Strait, the conclusion being that the great mass of the ocean tidal wave is thus prevented from entering it. But we consider that a more logical reason may be advanced to account for it. If we consider the general features of this sea, we find it divided into numerous compartments, many of which appear to constitute small lakes, nearly all of them being insensible to the luni-solar attraction, and only in its central portion which is the most important part and free from islands do we see the waters uniformly obeying the law of luni-solar influence and attaining at springs the height of six feet.*

We may, therefore, deduce from the foregoing that the cause of there being no uniformity of tides in the Mediterranean must be attributed to its special formation, that is, to the subdivision into small,

* Captain Smyth in the course of his exploration of the Mediterranean coasts took an opportunity of observing the tides in the channels of Karkenna and Jerba within the gulf of Kabes and he found a rise at springs of 1·7 in 5·6 feet, and also that the tide rose eight feet in a fresh *Levanter*. The losses which Count Pedro Navarro experienced in the island of Jerba (Geloës) on the 30th of August, 1510, were augmented by the impossibility of the people embarking to save themselves in his galleys, from his boats having remained aground at low water when the tide ebbing out exposed so much of the shore of the island.

portions by the receding and projecting of its line of coast, and by the islands which are off its northern and southern shores. Laying aside the reason of this singular condition of the case, it is certain that the tides of the Strait of Gibraltar are a powerful auxiliary in passing it from East to West with westerly winds, and the coasters, which are sailing vessels, know how to profit by it, and do so without any great difficulty.

Strength of the Tidal Stream.—One mile an hour may be accepted as the mean velocity of the tide at spring tides on the coasts of which we have been treating, but in the channels it reaches to three and even four miles an hour according to their direction. And the same takes place on the ebb.

In the vicinity of the western entrance of the Strait of Gibraltar, the ebb is always stronger than the flood, and its strength increases in proportion as it has passed Cape Trafalgar.

Establishment of the Port.—Such is the name assigned to the hour of the first high water immediately after the noon of the day on which the sizigies occur, or rather perhaps the days of conjunction and opposition of the moon. This hour is nearly constant for the same place in normal conditions of weather, etc., and the observations for its determination are confirmed at the anchorage, and also at the bars over which the tide passes.

Variation of Tide time.—However small the difference from the normal character of the weather, the actual period of high water varies a good deal, being affected according to atmospheric pressure, and the effect of the wind. In consequence of these variations, the hour of high water is later, because there is a larger collection of waters; while at other times it is earlier because there is less, a consideration which should be allowed in foretelling the time of high water when a vessel intends entering a port of small depth, and where it is indispensable to go in precisely at high water, as well as when leaving it.

The establishment of the ports are drawn up in tables for the use of navigators. The times stated in them are always the means of a multitude of observations made under favourable circumstances at every place; and the navigator must make allowance for the earlier or later period of high water according to the actual condition of the weather.

In bays and harbours of considerable depth such differences may be neglected; but they require special attention at places of small depth or when passing over bars or rocks of scanty depth of water.

Establishment of the Bay of Cadiz.—With respect to the bay of Cadiz, 1h. 30m. may be considered the establishment on all parts of the coast. But as the tidal wave progresses through all its channels, bays, and harbours, it alters, being later at each place, so much so that while at the entrance of the bay of Cadiz it is 1h. 24m. in the channel of Caraccas it is 2h. 30m.; at Chipiona it is 1h. 34m. and at Bonanza it is 2h.; at the bar of Huelva it is 1h. 54m. and at its mole it is 2h.

On the coasts of Portugal and Galicia the establishment is somewhat later, for while at Cascaes it is 1h. 40m. and at Lisbon it is 2h.; in

the mouth of the Douro at Oporto it is 2h. 30m.; at Finisterre it is 3h., at the Sisargas it is 3h. and at Corunna 3h. 30m.

Range of the Tide.—Such is the name given to the whole rise of the tide, or the difference of level between high and low water at the time of the sizigies. The height of the level of high water is more subject to change than the establishment of the port.

In the tables abovementioned the mean of a multitude of observations under normal conditions at the ordinary sizigies is called the range of the tide.

Range of the Tide in the Bay of Cadiz and on the Coast of Portugal.—The greatest height which the tidal waters attain in the Bay of Cadiz is from twelve to thirteen feet as a mean result at ordinary springs, and fourteen to fifteen feet on the coast of Portugal and Galicia. At equinoctial springs three to four feet high must be added to that height unless any atmospheric change takes place.

But it is very well known that the maximum height of the tide never coincides with the time of high water at the sizigies, but that it is from thirty-six to forty-eight hours later; consequently the navigator bound to a port having a shallow bar, must bear in mind that the highest tide will always be that corresponding to the second or third day after new or full moon.

Streams of the Tide.—Certain threads of the tidal stream appear always to take place as the consequence of the general current continuing until they disappear entirely. This phenomenon, constantly occurring in the Strait of Gibraltar, is scarcely perceptible at its western entrance. They are found more especially off the salient points of the coast, and with more intensity off those which project at right angles to it. Hence, off Cape Trafalgar the stream which bears its name is perpetual.

Cause of the Streams.—To all appearance these errant streams of tide are produced by the encounter of two opposite currents: and from what has been observed in the Strait, that the strength of it increases with the tidal stream attaining its greatest strength at half-tide when the streams of flood and ebb are at their maximum velocity.

The Cape Trafalgar Stream.—The errant stream off Cape Trafalgar is most violent, without failing its utmost strength in either tide whether it be ordinary springs or neaps. It extends off to the S.W., beyond and passing over the Aceitero rock until it becomes lost in the general current.

When the swell or sea runs in the same direction as the errant stream the waves rise so much as nearly to break, which leads to the suspicion that there are rocks in localities where they are unknown. It is advisable therefore for vessels to avoid them and to keep further even from Cape Trafalgar when there is a high sea running.

Errant Streams outside of the Straits.—Although these errant streams are common enough to the eastward of the Strait they are not to be found to the westward of it. From this it is natural to infer it should be so, because the general easterly current carries them into the Mediterranean until they subside, while in the western entrance of the

Strait they only begin to form themselves off Capes Trafalgar and Espartel.

Errant Streams off Cape St. Vincent.—In the Gulf of Cadiz to the West of those Capes these errant streams are unknown, and only outside Cape St. Vincent, and about three miles from it, now and then one is found which on account of the scarcity of them, has been taken for a rock. But this may be entirely attributed to the shock of the general current which runs on the Coast of Portugal with the stream of flood which sweeps out of the Gulf of Cadiz.

Similar threads of errant currents are formed on the Coast of Galicia, which sometimes alarm navigators as they occasion appearances as if formed by rocks. These threads may be the effect of the tidal stream as it leaves the estuaries, meeting the general current along the coast.

Rollers.—Such is the name given by the Spanish navigators, and *vaga de Mar* among the Cantabrians and Galician seamen to the swell which collects on coasts occasioned by the on-shore wind, but which does not itself reach the place where it is observed.

In the Gulf of Cadiz it is often observed, particularly in winter. A swell comes from the S.W., attracting attention by the noise which it makes by breaking on reefs. These noisy waves are the forerunners of the *Vendaval* which prevails beyond the horizon, and which sometimes is not long in coming, bringing along with them dense and heavy clouds which darken the atmosphere, while the waves inundate the coasts.

This swell is the precursor of the wind which produces it, and sometimes this wind does not reach the place where the swell is observed, being opposed by another more powerful current of air. But by the magnitude of the waves and the direction of their course, an opinion may be formed of the kind of weather which prevails in the district from whence they come, in the same manner as we can form an opinion of the wind which prevails in the loftier tracts of the atmosphere by the direction and swiftness of the clouds* which it carries along with it.

* Clouds are the surest indications of the direction the wind is following in the upper and lower regions of the atmosphere, for they show the direction in which the upper aerial currents are moving over that which we experience on the surface of the globe. The higher and lighter clouds are seen to move frequently in a direction contrary to that of the wind that is blowing below, and when this is observed we may prepare, before long, for the wind which is (as it were) thus promised, which is initiated in lofty regions, for it is certain that atmospheric currents are formed gradually from the higher to the lower parts, and in a manner more or less oblique.

From these small woolly but higher clouds, which are seen to move from S.W. to N.E., seamen know that the S.W. wind will soon follow whatever other wind may be blowing at the time with its corresponding weather.

A still higher stratum of clouds will enable the seamen to prognosticate the wind which will follow in a district more or less extensive, particularly evident on clear nights. We allude to what are called shooting stars. From time immemorial it has been believed by navigators that the wind will come from the point of the horizon indicated by them as from whence they came, and careful observations of Mr. Coulier Gravier, and which he is still following, partly confirm this assertion.

On the Coasts of the Gulf of Cadiz this swell is the certain indicator of the *Vendaval*, and sometimes it will foretell the wind even for two days. On those of Portugal and Galicia, whether it comes from S.W., West, or N.W., it is always a sign of the same weather prevailing in those directions, and its presence prognosticates the coming of the wind which sends it.

There are occasions when it delays much its arrival on the coast of the peninsula, and at other times the wind which produces the swell does not come at all for reasons already stated. But in general it is the signal of the wind which is about to prevail.

N.W. Swell.—A N.W. swell is very common in winter on the western coast of the peninsula, and in March and April is almost incessant on the African Coast. It is very well known to those navigators who make the voyage from the Straits to the Antilles, who begin to experience it as soon as they reach the meridian of the Canaries. They consider it to result from those heavy N.W. gales which come from Davis' Straits, and they are confirmed in this opinion by the fact that when they reach the meridian of Newfoundland the swell disappears, owing they consider to the impediment presented by the great bank.

This swell makes terrible havoc on the Coast of Africa, rendering it unapproachable for long intervals of time, and vessels which unhappily get on shore on that coast while it prevails, soon go to pieces and the crews are drowned. Vessels which are accustomed to lie in Jeremias bay and the coast about Laraiché as far as Cape Blanco for shelter from the Levanters, have good opportunity of observing this swell, which produces a mass of breakers on the rocks and distant banks which lie off the coast. Such heavy swell being observed by a vessel, she should on no account approach the shore under sail, for she might get becalmed and then thrown on the reefs, or might, in order to prevent it, be obliged to drop an anchor that might never be recovered.

The N.W. swell attains colossal dimensions on the West shore of the peninsula, and on the Coast of Spain. It shows itself in mountains of water of so wide a base that they attain a height of sixty to seventy feet, and acquire a force that would destroy the strongest vessels,*

This philosopher has observed that those meteors move in the higher regions of the atmosphere, and that they reveal the direction of these aerial currents in which they move, a revelation which coincides with barometrical indications. These currents on approaching the earth's surface disturb the most dense vapours, as well shewn by the barometer which indicates the approaching aerial currents, and foretells the direction of those luminous displays which leave behind them the exhalations called shooting stars.—*Researches on Meteors by M. Coulier Gravier.*

* Admiral Fitz-Roy in the *Thetis* frigate, observed sixty-six feet as the height of the wave in a gale in the Bay of Biscay.

The following are quoted by the "Annuario." The heights of waves in wide and deep seas in a gale of wind may be estimated as between thirty-five and forty-five feet from the summit to the base. There are authorities which assign forty-seven feet as the height with a distance between them of six hundred feet, and a rate of travelling of thirty miles an hour.—*N.M.* 1854, p. 49.

Sailing vessels finding themselves hampered by such seas near the coast have narrowly escaped a horrible wreck by a merciful interposition of Providence, in a favourable off-shore wind, by which only they have been saved from destruction.

Barometric Oscillations. When the barometer merely shews the weight of the atmosphere, it is even then useful to consult for the sake of knowing the changes which take place in it as the vast laboratory wherein the most destructive tempests and the most astounding meteoric phenomena are produced.

We know that the rising and falling of the mercury in the barometer are the result of the actual pressure of the atmosphere on the surface of the mercury contained in its cistern. A rising of the mercury shews an increase of atmospheric pressure on the surface in the cistern. This occurs with winds from the northern quarter, and consequently a rising in the mercury will always indicate a tendency of the wind to come from that quarter which is also always the coldest. Again, on the contrary, with a fall of the mercury in the tube it rises in the cistern, shewing a lesser pressure on its surface, and this is the case when winds from the southern quarter prevail, which again are also the warmest, and therefore a falling in the mercurial column is a prelude to winds from that quarter of the horizon.

Between these two extremes there is room for a multitude of gradations according to the density or lightness of the atmosphere, and hence the study of the oscillations in the tube of the barometer enlightens the navigator in the subject of atmospheric changes and enables him to foretell what will occur. Still it must be remembered that if for the most part the warnings of the barometer coincide with atmospheric changes they do not always accompany each other.

Notice of Southerly Winds. A fall in the barometer that precedes rain on our coasts generally indicates southerly winds, which are warm, and crossing the ocean come loaded with vapour. Consequently the barometer falling will always indicate an expansion of the atmosphere occasioned by warm winds from intertropical regions, but gives no indication whether from east or west of south, or whether it will be accompanied by heavy or light rain.

Notice of Northerly Winds. Again, the rising of the mercury reveals a condition of the atmosphere entirely opposite to the foregoing, because it is owing to northerly and north-easterly winds which are always the coldest and most dense, and because they pass over large continents they come to our shores in general dry and clear.

The atmospheric pressure indicated by the barometer also shews us different heights above the surface of the sea. A rise in the mercurial column or a depression of the surface in the cistern always accompanies a depression in the level of the sea and this is detected in the harbours where the high waters do not attain their usual level, and

In seas not very deep, waves attain an immense height, and have been observed more than one hundred feet high near the Eddystone in the mouth of this Channel.—*N.M.* 1835, p. 609.

the time of high water is earlier. The contrary takes place when the mercury rises in the cistern, for then, the least pressure raises the level of the water and the time of high water is later. Thus it is that the pilots of the ports, fishermen, and others acquainted with the sea, foretell by means of these differences of height the probability of northerly or southerly winds.

- In fine weather the level of the water is much lower than ordinarily with northerly winds and a low thermometer, and the contrary takes place when the wind is southerly and the temperature high. All this is observed most satisfactorily in the ports of the Mediterranean which are not subject to tides.

When the barometer rises or falls slowly for two or three consecutive days its indication may be most assuredly depended on ; but rapid changes indicate wind or bad weather.

The thermometer generally follows its movements in a manner contrary to those of the barometer ; that is, it rises when the barometer falls and vice versa. A high barometer and a low thermometer always foretell northerly winds, and barometer low with thermometer high southerly winds.

The changes of the barometer off Cadiz are very remarkable. In the course of five years' observations in the Tower of Tavira it never varied above an inch. In January, 1858, it attained its highest reading with a northerly wind and clear sky ; and it was at its minimum in November of the same year, with a heavy south-wester and torrents of rain.

Other observations before us at the Astronomical Observatory of San Fernando at Eight every morning from the First of January to the end of July, 1865, shew that the whole range of the barometer was 1.024 inches, the highest which was 30.6 occurred in February, 1864, with an E.N.E. wind light, thermometer 38°. The lowest was 29.5 in March of the same year with strong southerly winds and rain, thermometer at 54°.

In the Gulf of Cadiz the changes of the thermometer are very small. The small variation of its climate is its best praise. Situated in a temperate part of the world, and far from the snowy peaks of mountains it is not subject to much change of temperature. The sky is mostly clear and but little rain falls there. Nor is it much visited by thunderstorm. But it has a reminder of the Levanter of which we have already spoken.

Coast of Portugal. How different from this is the weather of the coast of Portugal and also Galicia, where it rains during a great part of the year ; because here it is that those watery winds which come across the Atlantic from S.W. and N.W. discharge the showers with which they are loaded.

For the same reason the barometer changes are greater on these coasts than in the Gulf of Cadiz, and this is proved to us by the observations extending through a period of two years at Lisbon.

From these observations it appears that the range of barometer was small ; that the highest reading of the barometer was 30.5 with the

wind at N.E. light and clear in February, 1865; the thermometer being at 54°.

Fog. This vapoury condition of the atmosphere is another of the enemies which the navigator has to contend with, very often to his loss, for they not only blind him to external objects but at the same time allow him to be driven along with the surface current of the ocean.

According to scientific men fogs are occasioned by the difference of temperatures between adjoining regions of the ocean: and their occurrence is, at the mouths of estuaries, the land in the vicinity of which sends forth a vapoury atmosphere which is condensed with the cold atmosphere of the low capes.

Fogs on the coast of Spain. The coasts of Galicia and Portugal are much visited by fog, and principally at the mouths of the estuaries. But they are most frequent in moderate and wet winters.

Fogs in the Strait. In the Gulf of Cadiz they are occasionally very enduring especially at its western entrance. At the termination of the easterly wind they usually occur there appearing like a barrier to it, gradually advancing to the eastward until they completely cover it, and clearing away as soon as the westerly wind is fairly established.

The fogs which collect about daylight at the mouths of the estuaries of the Portugal and Galicia coast generally clear away about noon.

Fogs on the African coast. On the coast of Africa there are also in the early morning or later these same fogs and generally with N.E. winds. Sometimes they will extend over the entire Strait, forming in the western part of it like a wide curtain, and as night approaches completely cover the whole coast.

Sometimes they are so close down to the surface of the sea that it is common to see the masts and rigging of vessels above these fog-banks, while their hulls are entirely concealed by them. Fortunately this occurs in quiet weather, when vessels under sail make little or no progress, which adds to the chance of bells, foghorns, or any such noisy instruments being heard, and thereby keeping clear of each other, numerous as they may be as in the Strait of Gibraltar.

Nevertheless these precautions are not always sufficient to prevent collision between vessels, for the streams of the currents will drift several at once, occasioning their fouling in spite of their attempts to prevent it, and if on these occasions there should be added a strong tide, the consequences become still more serious.

Steamers under such circumstances slow their speed, making their positions known by the steam whistle; and generally suffer least as they always have the means of keeping out of each other's way.

Haze. A hazy state of the atmosphere is almost as bad as fog if happily it is not so dense. This occurs in times of great heat, and on the coasts of Portugal and Galicia is most frequent with N.E. winds.

In the summer time in the Gulf of Cadiz, especially with light southerly winds, the haze on the horizon is considerable, and the effect of it on vessels and buildings near the sea is so great as to alter their form in appearance, and throw out the points of the shore as if they were lifted above the water. A considerable amount of haze generally

indicates humid and wet weather, and easterly winds with a tendency to the south.

During a dry winter in these localities, thick fogs will occur and not admit the shore to be seen except at a very short distance.

A general fog more tepid still will occur at this season with the *Vendaval*. These become so extensive as to cover the whole coast under our consideration.

Navigators who may be making the land under these unfavourable circumstances, are frequently at a loss to determine what land it is they may have in sight, for notwithstanding their reckoning may be good, the heights of the interior are still concealed from them. Even the objects on the shore are so distorted that white towers and such like buildings are often mistaken for vessels under sail. And if the coasts they are on have outlying reefs and are shoal to approach, they are in the risk of getting aground unless some break indicates their presence.

THE QUEEN ADELAIDE NAVAL FUND.

For the benefit of the Orphan Daughters of Officers of the Royal Navy and Royal Marines.

THE readers and friends of this work will admit that it is an important part of its duty to bring before them occasionally, not only the condition and progress of the little auxiliary institution which bears the above name, but also to shew how much it is in need of their assistance and that of the British public in general. Appeals which from time to time have appeared in these pages, as well as in those of our contemporaries, have been successful, in making known the existence of that Institution; and it would have been still more satisfactory could it be said, that, those appeals had been equally successful in bringing to its resources the means of meeting more liberally the numerous applications made to it for assistance.

Those applications, to which the Society has been compelled to reply with refusal, are in fact so many proofs of the great amount of privation existing in that class, the relief of which is the object of this Society. And indeed the full extent of that privation can only be known to those who would accompany the Committee in their duty of investigation with a view to relief.

During the seventeen years of its past existence the operations of the Queen Adelaide Naval Fund have been actively but quietly conducted. Perhaps it might be said to have been feeling its way, silently and steadily with what sympathy it could obtain; but it is too true, that each year as it passed by, has added conclusive proof of the accumulating want there was for its assistance,—in fact, of the abundance of work there was for it to do!

Founded in 1850, by the widow of an accomplished naval officer, who lost his life while in command of his ship in the cause of duty, its

operations up to the present year have been carried on by the untiring efforts of that self-denying lady, Mrs. Skyring, aided by her devoted son, who, as Archdeacon Robinson most justly observed at a public meeting, held in April last, was "eminently fitted for the work, not only by his abilities, not only by his zeal in the service of this useful charity, but by his great affection to his mother, which prompted him to continue in the good work, and to assist the Society in every way that he could." That amiable gentleman, esteemed by all who knew him, has been removed by the hand of death, and the Society, while mourning for his loss, has also the additional sorrow of seeing that enfeebled health has necessitated the withdrawal of Mrs. Skyring's able and active assistance. She whose noble mind originated this Society, by whose well directed efforts it has reached its present useful condition, under the weakened energies of advancing years, feels the necessity of rest; she lays aside the burthen of its cares, and as a Christian would say to her Christian successors, in all the fervency of her warm and charitable heart, yet, in faltering accents at seeing the grateful task, where adversity has called, slipping away from her, she resigns it to them, and might add were it necessary—"Go, and do thou likewise!"

And shall we not do so? Shall the good work not go on? Shall so useful a Society,—one though small at present yet so much needed,—one that has proved its valuable assistance and imparted joy where sorrow and suffering reigned!—Shall such a society be permitted to languish and droop in distress at its loss? We think not. Such is not the way of our countrymen. This little Society has passed its youthful trials, and great they have been. Yet it looks with confidence to future years of increased usefulness, and that confidence is founded on the benevolent Christian feelings of those who know the gallant hearts of which our Navy is formed,—those who can feel for them in their rough and perilous duties throughout the world, and not only feel for them but can say, "Yes, go on, we will help you, we will assist you."

The Adelaide Naval Fund, encouraged to take its part in the field of benevolence under the fostering care of such names as those of Sir Francis Beaufort, Sir Charles Adam, Sir Edward Parry, and many more too numerous to recite (names dear to the Naval Service at large), has succeeded in doing much good. And shall it be said of their successors, that the Naval Service is unmindful of the example left to them,—that they are indifferent towards the good work, and that they can withhold from this valuable little institution (thus bequeathed to them) that small support essential to the performance of its task of love? We do not believe it; we are confident that it is only necessary to bring before that Service the claims of this *now little* Fund, to ensure not only their support, but the support indeed of every officer in that Service! Who is there in it, even to the lowest rank, that could not contribute *annually* some small fraction of his pay in support of labours so excellent, so useful as theirs? And readily would any post office of this country *add wings to a money order*, by which the

Hon. Secretary could receive its amount in London from those who *must be* disposed to assist the widows and orphans of their less fortunate brother officers.

An income of three hundred pounds a year is scanty enough as composing that of the Adelaide Naval Fund. But of this, only about seventy pounds derived from an invested capital of two thousand four hundred and twenty pounds, can be regarded as permanent income. Great need there is indeed of donations to increase this capital. Great need there is of a larger list of annual subscribers to meet the many wants which its small permanent income cannot relieve.

To the public at large the Society appeals on the score of the risks of all kinds to which the Navy is exposed, and the hardships endured by every branch of that profession,—their constant trials of separation from all that is dear to them,—the difficulties they meet in making provision for their maintenance,—the additional expenses they incur on account thereof, owing, irrespective of service risks, to their frequent exposure in bad and unhealthy climates,—the increased cost of life insurance being itself a serious impediment to their making an adequate provision in that way. These are indeed difficulties unknown to those who “live at home at ease.”

To those of the Naval and Marine Services it appeals, with all the earnestness of parental care. A day's pay or even part of one by way of *annual* subscription would go far, very far, in assisting the exertions of the Committee, whose duty it is to enquire into and relieve, as far as it can, the distress which comes before it. And we would commend for imitation, the example of the officers and crew of H.M.S. *Princess Royal*, in China, who, twice by means of amateur theatrical performances were enabled to send donations respectively of eighteen pounds and eleven pounds. Such sympathy with the families of their deceased brother officers is especially valuable, as becoming the character of Christians towards the suffering relicts of their late Christian brethren. To the generously disposed the power of helping those who with every desire to assist themselves, are borne down by circumstances, difficult if not impossible to control, is ever a strong incentive. We ask them to emulate the example already set by those, who in anticipation of their final summons, appropriate some portion of the wealth they leave behind them, not to forget the interests of this Society. And it is with pleasure we can tell them that the Report of the present year speaks of one hundred and fifty pounds *this* added to the permanent stock of the Queen Adelaide Naval Fund.

To the mercantile community at large we also appeal with confidence; themselves not unaccustomed in many instances to a sea-faring life, they can well appreciate the risks and hardships involved in naval duties. They too know what separation from home is—though theirs is generally speaking for a much more limited period, and less dangerous service than that of their brethren in the Royal Navy. Unlike these however, they possess greater opportunities of adding to their “provident fund,” and laying up a competency for old age and for those they leave behind. May we not therefore appeal to their

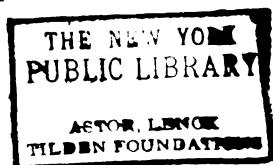
sympathies in behalf of the orphan daughters of deceased Naval and Marine Officers? We cannot help doing so, and anticipating a response in accordance with our confidence.

But our readers may ask, How is relief afforded? The answer to this question is simply this: The income of this Society is derived partly from donations, and partly from annual subscriptions. The former of which (after payment of the small working expenses) is devoted to the increase of the permanent capital, by investment in the three per cent. consols. The dividends on that capital are appropriated to the educational wants of the orphans assisted, and from this source three girls are at present maintained in the Royal Naval Female School at Isleworth. The annual subscriptions are expended in furtherance of the other objects of the Society, viz., the maintenance of the aged, or the casual assistance of those who are in temporary difficulty.

Would that all or even a tithe of such cases could be relieved. Yet, alas! the more enquiry is pursued, the more is realized the fearful extent of the destitution which this Fund is *designed* to relieve. Certainly three hundred pounds a year is but a small sum to cope with the sad necessities which are daily revealed. We fully agree with the Rev. Edward Parry, the Rector of Acton, when he says, "that this Adelaide Fund, small and unpretending as it is, is doing a really good and useful work," and we cordially re-echo the hope he expressed, that at the end of another year, its annual income might be "increased to twice or even three times" its present amount. In this view it is, that we have ventured to urge on the benevolent friends in general of the Naval Service, the claims of the Queen Adelaide Naval Fund—believing as we do, that the good already effected by its means is sterling promise and guarantee of what it might accomplish were ample funds at the disposal of its Committee. It is a Society which is being worked *con amore*, in the true spirit of benevolence. It has no paid staff,—it has no office whatever,—its working expenses are limited to postage and stationery,—every case which comes before it is thoroughly investigated, and where possible visited by a Member of the Ladies' Committee;—in fact all is done that can be done to ensure a just appropriation of the sums entrusted to its care.

Many are the cases brought before the Committee of this Society that are most deserving of relief, but which it is found perfectly impossible to assist owing to the very limited means at its disposal; and they receive the all but stereotyped reply of regret that want of funds precludes a grant.

Instances such as those stated in our pages of August last could be multiplied were it necessary to do so. We think, however, that enough is now said to set forth in strong light the great claims which this Society really has to kind and considerate attention; and we shall be glad indeed to learn hereafter, that any of our readers have been induced by these remarks to contribute in aid of its funds. We have said that it has no office, and therefore they should be informed that any communication addressed to its Honorary Secretary, Frederic



GENERAL
WRECK CHART
OF THE
BRITISH ISLES
FOR
1866.

Compiled in the Board of Trade
from their Wreck Register.
SHOWING ALSO THE PRESENT
LIFE BOAT STATIONS.

- *Signifies a Casualty*
⚓ *Represents a Life Boat.*

Scale of Nautic Miles.
10 0 50 100

1674ugh Rd

rough

Myton

urn H^o

1674ugh Rd

Gibraltar Pt

WASH

Ter Schelling

Holder

J. Bowden, Esq., Admiralty, Somerset House, will be immediately most gratefully acknowledged.

In conclusion, we cannot do better than repeat what a contemporary (Colburn's United Service Magazine) has so well said in one of its recent articles respecting this little Fund. Referring to the distress which exists in the families of deceased officers it says, "Most heartily ought any Society to be welcomed which with right good will endeavours to alleviate their miseries and assist in their difficulties. The Queen Adelaide Naval Fund requires no more persuasion to assure Naval Officers or civilians of its use, and of the necessity of supporting it, than any of the other important and valuable societies connected with the two services. But it has been kept too much in the background; for having been successful to a limited extent hitherto in carrying out the objects for which it was founded, it only requires now to enlarge its field of work, and appeal boldly, not only to Naval Officers, but to the public for support. It has been successful; we hope, that in future, it will not only be successful but flourishing."

Our own exertions in aid of the Queen Adelaide Naval Fund date from a very early period in its life, for in the pages of this work it was that its first announcement appeared.* Here its very birth was recorded, and herein we trust yet to report from time to time that success which it so well deserves. We regard it as the offspring of well directed benevolence, as the humble instrument by which much good has already been effected, and we trust that much more will still be produced by it. In this light we most heartily desire to see it prosper, and we do look forward to its growing year by year in the estimation of a discerning and generous body of friends and supporters, both in and about the Naval society of this great country.

THE WRECK REGISTER AND CHART † FOR 1866.

WE have for many years past been in the habit of making a few remarks on the Wreck Register, prepared by the Board of Trade, and presented to Parliament; and we have done so principally with the view of directing attention to the loss of life from shipwreck on our coasts, and to the means employed in rescuing shipwrecked sailors.

We find, on examining this carefully-compiled register, that the number of wrecks and casualties from all causes on the coasts of the United Kingdom, and in the surrounding seas reported in 1866, was 1,860. The number reported in 1864 was 1,390, and in 1865 it was 1,656. The annual average number of casualties during the five years ending 1866 was 1,611; and during the five years ending 1865,

* In our volume for 1850, the proposal first appeared of this Society in page 117, where a curious misprint occurs of 1853 for 1850.—ED. N. M.

† The Chart relating to this Article was inserted in the November Number.

1,538. The average number of shipwrecks on our coasts during the past ten years has been 1,466.

A recent statement by the Bishop of London shows that the population of the Metropolis increases at the rate of 40,000 a year, and that 10,000 houses have annually to be built to accommodate this increase. A similar progression is observable in our commercial and shipping interest. Seventy millions sterling often pass in one week through the bankers' clearing-house in London. Of course this enormous transfer of money representing commercial transactions necessarily indicates the countless number of ships from all parts of the world that frequent our numerous ports, in addition to the thousands of British vessels engaged in our Foreign and Home trade. Thus it is that the aggregate number of vessels entering inwards and clearing outwards from all our ports in 1866 was 403,598, the number in 1865 being 402,255. It is not surprising, therefore, that considering the enormous number of voyages thus performed, the number of shipwrecks every year on our coast is necessarily proportionately large; although of course, their number will depend very much on the violence of the gales of the year.

Thus, in October, 1859, there was the "Royal Charter" gale, and a loss of 343 ships. In January, February, and November, 1861, there were north-east and south-easterly gales, which added 460 to the number of that year's casualties. In January, October, and December, 1862, there were westerly gales, with upwards of 540 casualties; and in January, March, September, October, November, and December, 1863, there were westerly gales, with 930 casualties. In November, 1864, there were 264 casualties, with the wind chiefly in the south-south-east and south-west; but owing to the absence of any special gales of remarkable duration and violence in 1864, the total number of casualties in that year was 274 below the number in 1863. In 1865 the gales of January, February, and March, and October, November, and December, gave 766 casualties.

During the gales of 1866, that is, when the wind was blowing at force 9 and upwards, 855 disasters occurred. The gales of that year were usually from the following quarters, viz.—January, from east-north-east, south-west, and south-south-west; February, south-west, west-south-west, and south-south-west; March, south, and south-south-west; October had no serious gales; November, west-south-west, south-west, north-west, and west; and December, south-west, west-south-west, and south-south-west.

The number of ships lost or damaged in the 1860 casualties reported in 1866 is 2,289, representing a registered tonnage of 427,000 tons. The number of ships in 1866 is in excess of the number in 1865 by 277. The number of ships reported as lost or damaged is, as has been formerly stated, in excess of the number of casualties reported, because in cases of collision two or more ships are involved in one casualty. Of the 2,289 ships, 1,961 are known to have been ships belonging to Great Britain and its dependencies, with British certificates of registry, and 294 to have been foreign ships. Of the

remaining 34 ships the country and employment are unknown. Of the British ships, 1,409 were employed in the British coasting-trade, and 549 were employed in the (over sea) Foreign and Home trades; and of the foreign ships 15 were employed in the British coasting trade.

Of the total number of casualties reported in 1866, 422 were collisions, and 1,438 were casualties other than collisions. Of these 1,438 casualties other than collisions, 562 resulted in total losses, and 876 in partial damage more or less serious. The whole number of casualties other than collisions reported in 1865 was 1,302, which is far in excess of all other years, excepting 1863, when the number was 1,333; but in 1864 the number was 1,039, which was less than the number reported in any year since 1858.

The annual average for ten years, including 1866, is for total losses 463, and for partial losses 668; as against this the numbers for 1866 are, for total losses 562, and for partial losses 876.

Of the 562 total losses from causes other than collisions, we are unable to find in the Register the details of the precise cause of the same; but we observe that in 1865, 245 of the total losses happened when the wind was at force 9 (a strong gale) or upwards, and are chiefly included in the following returns as having been caused by stress of weather, 38 arose from defects in the ship, or in her equipment (and of the 38 no less than 30 appear to have foundered from unseaworthiness); 99 appear, from the reports made by the officers on the coasts, to have been caused by inattention, carelessness, or neglect, and the remainder from various other causes.

Of the 832 partial losses other than by collision, we can find no details of the causes of the same in the Register—but we notice that in 1865, 501 happened when the wind was at force 9 (a strong gale) or upwards, and are included as having been caused by stress of weather; 137 arose from carelessness, 48 from defects in the ship or her equipments, and the remainder from various causes.

Surely a large number of these casualties are preventible ones. It is true that within late years the standard of qualification for masters and mates of our merchant-vessels has been considerably raised. We think it might with advantage be more generally extended, as of these disasters a large proportion can be clearly traced to the ignorance as well as carelessness of man rather than to the elements over which he has no control. It should, however, be remembered that good seamen cannot save a bad craft; and we certainly think that something ought to be done with the wretched rotten colliers that crawl along the coast at the instance of mercenary men who care more for money than for human life. Many of these vessels are so decayed and unseaworthy that Shipping Insurance Associations will not even admit them on their books. There is no law in existence to prevent them putting to sea, and so they are navigated at such cost as the Wreck Chart which accompanies the Register too plainly indicates.

Again, let us remember that the total number of ships which, according to the facts reported to the Board of Trade, appear to have

foundered or to have been otherwise totally lost on the coasts of the British Isles, from unseaworthiness alone, in ten years, is 423; and the number of casualties caused through unseaworthy ships, unsound gear, etc., and resulting in partial damage, in the same time, is 586.

In 1866 there were 116 casualties to fishing-smacks alone. Excluding these 116, the number of vessels employed in the regular carrying-trade that have suffered from wreck or casualties during the year is 2,173. On this number being subdivided we find that about half of it is represented by the unseaworthy, overladen, or ill-found vessels of the collier class chiefly employed in the coasting trade.

Thus, then, amidst this dreadful havoc arising from rotten ships, and when the storm has shouted and raged in the bitter night, the wild despairing cry

“Of the strong swimmer in his agony”

has been borne on the fierce cold winds to straining ears in the life-boat, or at the rocket-station on the shore; many a cheek has been whitened, never to bloom again; many an eye has faded, never more to shine; and many a home has been made desolate for ever. Would it not be something, then, to save even one life, with all its hopes, and to keep the home of one poor woman and her children unclouded by the pangs of desolation? There is plenty of room here for those who wish to do good, for its own sake, through the National Life-boat Institution.

We find that the number of wrecks amongst colliers, laden and in ballast, was 854. In addition to colliers laden and in ballast, 141 vessels were laden with metallic ores, and 154 with stone. We all know, from long experience, that the colliers of the north-east coast have an established reputation as the rottenest and worst-found vessels that leave our ports. Year after year we learn that the casualties which might be expected have overtaken them; but still the mischief goes on, neither the provisions of the common law nor the special acts which relate to shipping being sufficient to control it. There is only one thing that will remedy the evil: if the men who navigate these wretched craft had received the education that brings intelligence and self-respect, and which, in some other countries, is the birthright of the poorest citizen, they would be less disposed to permit themselves to be sent to sea in what are no better than floating coffins.

In the eight years ending in 1866, casualties to comparatively new ships bear a very high proportion to the whole number of casualties. We find that 1,135 happened to nearly new ships, and 1,981 to ships from 3 to 7 years of age. Then there are casualties to 2,566 ships from 7 to 14 years old, and to 4,185 from 15 to 30 years old. Then follow 1,528 old ships from 30 to 50 years old. Having passed the service of half a century, we come to the very old ships, viz., 283 between 50 and 60 years old, 127 from 60 to 70, 61 from 70 to 80, 19 from 80 to 90, 8 from 90 to 100, and 4, 101 years and upwards. The age of 3,298 is unknown. The state of rottenness and want of repair of some of the coasting-ships above 20 years old, often calls for remark.

Even at the age of 25 to 30, it occasionally happens that a ship is so rotten as to fall to pieces immediately on touching the ground, without giving the crew the slightest chance of getting out their boats.

Of the 2,289 vessels lost or damaged in 1866, 86 were rigged as ships, 150 were steam-ships, 631 schooners, 426 brigs, 249 barques, 257 brigantines, and 167 smacks; the remainder were small vessels rigged in various ways. Of the 2,289 vessels referred to, 977 did not exceed 100 tons burden, 939 were from 100 to 300 tons, 274 were from 300 to 600 tons, and 99 only were above 600 tons burden.

As usual, the greatest number of casualties have occurred on the East coast. The numbers are as follow :—

East coast	..	..	..	..	..	953
South coast	..	..	..	..	..	274
West coast	..	..	..	..	..	412
North-west coast of Scotland	..	..	..	..	..	47
Irish coast	..	..	..	..	..	144
Isle of Man	..	..	..	..	..	18
Lundy Island	..	..	..	..	..	9
Scilly Isles	..	..	..	..	..	3

As regards the loss of life, the returns show that the number of lives lost from shipwreck on or near the coast of the United Kingdom, from all causes, in 1866, is 896.

When it is remembered that the lives thus lost are taken from amongst probably half a million of persons who have visited our ports during the last year alone, the number may appear to the casual observer a comparatively small one. We are, however, of opinion that it is a very large number, and when we bear in mind the inestimable value of one life we are convinced that no effort should be left untried which can in any way lessen the annual loss of life from shipwreck on our coasts. And here we may remark on the noble and great efforts that are being made to save life from shipwreck. During the last year and a half the National Life-boat Institution has, by its life-boats and other means, contributed to the saving of upwards of 1,600 lives, in addition to bringing to ports of safety some 40 vessels from threatened destruction. Again, this large number of 1,600 lives is entirely independent of the lives saved during the same period by the rocket-apparatus, which is worked by that valuable class of men the Coastguard, and which is provided for by the Board of Trade out of the Mercantile Marine Fund.

It is gratifying to observe how that Department continues to work cordially with the National Life-boat Institution in carrying out the great and important work which it has undertaken to promote, and which has proved so completely successful on our coasts; when we take into account the fact that the Society has now a noble fleet of 183 life-boats on our shores, requiring a large permanent annual income to maintain them in a state of thorough efficiency, no one can doubt that the Institution is deserving not only the continual co-operation of the Board of Trade, but of the sympathy and support of the British public at large.

On further analysing this Wreck Register we find that the lives lost in 1866 were in 199 ships; 147 of them were laden vessels, 40 were vessels in ballast, and in 12 cases it is not known whether the vessels were laden or light. 161 of these ships were entirely lost, and 38 sustained partial damage. Of the 896 lives lost, the very great number of 324 were in vessels that foundered, 127 lives were lost on board vessels in collision, 393 in vessels stranded or cast ashore, and 52 in vessels lost or damaged from other causes.

While the greatest number of casualties happened on the east coast of England, it is clearly shown that the greatest loss of life during the seven years ending 1866 occurred in the Irish Sea. The number of lives lost in that sea during the seven years is more than double the number lost on any other part of the coasts. During the winter months hardly a week passes in which the life-boats of the National Life-boat Institution stationed on the Irish coast are not called out to render assistance to ships in distress on the Blackwater and other dangerous sandbanks on that coast.

The most fatal winds during the year were as follows:—N., 37; N.N.E., 38; N.E., 97; E.N.E., 92; E., 69; E.S.E., 41; S.E., 90; S.S.E., 69; S., 129; S.S.W., 157; S.W., 206; W.S.W., 174; W., 105; W.N.W., 101; N.W., 115; and N.N.W., 45.

It is thus shown that westerly gales are far more fatal than easterly gales, the most fatal being from south-west. Seven hundred and thirty-three casualties happened when the wind was at force 6 or under, that is to say, when it did not exceed a strong breeze, in which the ship could carry single-reefs and top-gallant sails; 122 happened with the wind at forces 7 and 8, or a moderate to fresh gale, when a ship, if properly manned and navigated, can keep the sea with safety: and 954 happened with the wind at force 9 and upwards, that is to say, from a strong gale to a hurricane.

The large aggregate of 1,860 casualties in 1866 leading to the loss or damage of 2,289 vessels has, as a matter of course, thrown a vast amount of labour on the Wreck Department of the Board of Trade, which is most efficiently administered. Their officers at the outports, and the officers and men of the Coastguard service, have also discharged their duties in this important work in the most exemplary and zealous manner.

We should also state that the Statistical Committee of Lloyd's have issued a tabulated analysis of the wrecks and casualties reported in "Lloyd's List" for the year 1866. This is the first publication of the kind, and is intended to be repeated annually. It cannot fail to aid materially in concentrating public attention on Wreck disasters, and in leading to a thorough comprehension of their causes and their remedies.

The aggregate loss of life is enormous, and so is the aggregate destruction of property. The former is a species of woe inflicted on humanity: the latter is practically a tax upon commerce. While the art of saving life on the coast is understood (thanks to the progress of science and to the stout hearts of our coast population), the art of

preserving property is as yet but imperfectly known amongst us, and still more imperfectly practised.

On reviewing this dismal record, we are bound to take courage from the many gratifying facts it reveals in regard to saving life which, after all, is our principal object in commenting on this doleful Register. Noble work has been done, and is doing, for that purpose, which has not only elicited the admiration of the British public, but also that of many foreign nations. This fact was strikingly illustrated last July, by the international Jury of the Paris Universal Exhibition awarding to the National Life-boat Institution one out of their nineteen great gold medals in acknowledgment of the important services it had rendered to shipwrecked sailors of all nations,—thousands of whom it had rescued from a premature grave, and many homes from the desolation of widowhood and orphanage.

COLLISIONS BY STEAM VESSELS.

SIR,—Amongst the many recorded opinions on the subject of Collisions by Steam Vessels it is more or less admitted that they are owing to the difficulty experienced in knowing their relative positions on meeting, and it must be simply absurd, and a mere waste of words to argue otherwise, or there would be no apprehension of danger from causes, which produce the terrible disasters that are so frequently recorded by the press. Nevertheless no one appears bold enough to directly state that it is principally owing to the lights themselves as now placed, and not to those in charge of the vessels that the real cause of collision, and the too frequent loss of life is to be attributed. But as I have written on this subject before, and well weighed every argument that can be brought to bear on the present system of carrying side lights in steam vessels, and not having to bolster up a patent, or serve other private purposes for the sake of pecuniary advantage, I again take up the question solely on public grounds, as I consider it would be evading a duty I owe to my fellow-man, did I allow a subject of such vital importance to remain in abeyance.

Referring to Lloyd's Annual Summary of Wrecks and Casualties from January to December, 1866. I find under the head of Collisions that *three hundred and twenty ships, and one hundred and seventy-two steam vessels, were not damaged, or results unknown, that one thousand one hundred and twenty-five ships, and one hundred and forty-three steam vessels were damaged, and that ONE HUNDRED AND SIXTY-NINE SHIPS, AND TWENTY-NINE STEAM VESSELS, WERE SUNK FROM THIS ONE CAUSE.* And although the values of the hulls, machinery, and cargoes, are not stated, or the number of lives lost registered, with the absence of other details of lesser note, still the mere outline of such recorded facts is in itself appalling, and frightful to contemplate.

Compare this with the sacrifice of even one life on shore where a

supposed assassin has been the perpetrator or when lives are destroyed through more remote causes. In the one case the law does not rest satisfied until the offender has paid the penalty of his crime, and in the other case a more effectual check against further casualties is at once suggested and adopted. But collisions after collisions take place between vessels ;—lives and property are sacrificed wholesale, with an almost daily increase, still no remedy is given for the safety of those, whose business is on the greatest highway of nations. If it be simply because it becomes an almost universal question as regards the alteration of lights for steam vessels, owing to the very general use they have obtained, then I say the greater necessity there is for an effectual remedy, if it can be found, and safely applied, and which I submit my plan will fully accomplish. That the first introduction of side lights was considered a boon by the many, I readily concede, but the proofs of their defectiveness have been so numerous, so various, and so convincing that the mind sickens at the thought of the sacrifice of life they have engendered.

In a former letter I endeavoured to some extent to point out the benefit of carrying lights on board of steam vessels *in a direct fore and aft line with the keel*, and to which letter I might have expected a reply. But it is not every practical man who can afford to give an independent written opinion on such a subject. Nevertheless they must silently admit that my plan is the only correct one to protect life and property at sea, *and that my arguments are unanswerable*; for without being considered egotistical, I think I can fairly lay claim to a very large share of practical maritime experience, and am fully competent to form an accurate judgment on a point of so much importance to the shipping interest of this country. And I emphatically state, that lives and property will be jeopardized so long as side lights are used on board steam vessels.

In support of this assertion, I feel assured, that no more conclusive illustration can be adduced than the collision of the screw steamers *Bhima* and *Nada* on the 11th September, 1866, and belonging to the same company, when meeting in the Red Sea from nearly opposite points, with plenty of sea-room, on a clear night without any sail set, and no other light or vessel near, whereby the *Bhima* with a valuable cargo of cotton, etc., and seventy-nine lives were lost, including the commander of the steamer, and some of the cabin passengers. And if this single, but dreadful case, was the only one on record, it is sufficient to justify their wholesale condemnation.

Further, I submit that life and property must always be imperilled until the relative positions of steam vessels when meeting, can be instantaneously ascertained, and clearly defined, *and this is an utter impossibility with side lights*. For where two steam vessels are approaching each other from opposite points of the compass and can alter their respective courses at least eight points without either being aware of the fact, such a state of things must unquestionably, severely put to the test, all the experience of their commanders to prevent a collision.

But much stress is always laid on the masthead light as being capable of materially assisting their judgment, far more so in my opinion than is warranted by facts. For it is so likely to be obstructed from such a variety of causes, by its position under the top, as the head sails when set must interfere with its being seen (*and this fact I do not think has ever been referred to at any court of enquiry on collisions*, I certainly do not remember having seen it), besides the possibility of its being rendered useless when the foresail is hauled up. These with many others all tending to destroy its efficiency, and when combined, create very grave doubts on the ability of this particular light at all on which so much is made to depend, whilst all that can be said in favour of side lights, is, that they show the starboard, or port sides of the vessel as the case may be. But as the side lights do not point out the relative courses of steamers, excepting to a very indefinite extent, they can only be looked upon as ordinary signals, and not positive indicators of real danger. Independent of this, they are so liable to be obscured from local causes, or totally extinguished in heavy weather, with the improbability of their being relit (under such circumstances).

These objections combined with the impossibility of seeing them from the bridge or quarterdeck by the officer of the watch, who is thus left in entire ignorance as to their effectiveness, proves them to be totally unsuited to the grand object for which they were intended. It is scarcely necessary for me to state that it would be next to impossible for a collision to take place such as is herein recorded, with lights, or danger signals fixed in the positions suggested by me, and that little evidence would be wanting to prove who was in error should a collision ever occur; as each vessel's lights *would instantaneously show the extent of the hull or limit of the danger*; the two lights forward forming an unerring guide (would when seen even slightly open) with the stern or after light exhibited, prevent the possibility of a collision unless brought about by the most gross dereliction of duty.

In conclusion, I have only to add (that independently of the head sails and square foresails, and which principally applies to the present system), there is no real foundation from which an objection to my plan can be raised, and that it combines all that is requisite to make it the most perfect safeguard against collisions by steam vessels, ever brought under public notice.

I am, Sir, yours faithfully,

N. HECKFORD,

*Late Surveyor of Shipping,
Port of Calcutta.*

Forest Gate, Essex,

7th November, 1867.

[In our April number (p. 180) will be found Captain Heckford's proposal, and his experience of about thirty years of a sea-life in command of many vessels entitles that proposal to consideration. He writes strongly and earnestly, and we trust that his plan will receive attention.—Ed. N. M.]

THE MERCANTILE MARINE.

Among the subjects alluded to in the Speech from the Throne at the opening of Parliament, on the 19th of November, it was stated that "Measures will be submitted during the present Session for amending and consolidating the various Acts relating to the Mercantile Marine." There can be no doubt that the single measure of the supplying of Limejuice, which was passed into a Law at the end of the last Session, there was attached to it several others which were struck out, perhaps owing to the want of time for their due discussion. And the obligation to supply limejuice to the crews of an adulterated kind, instead of the wretched compound which was substituted for it by unprincipled owners, was made tolerably binding, and such that it will be difficult for those persons to contravene. But let us see what subjects remain still to be dealt with in the forthcoming amendment of "the various Acts relating to the Mercantile Marine."

One most important step affecting the treatment of our mercantile seamen, and we place it first, is to let them have the residue of their pay directly their services are dispensed with according to the law at present; so that there be nothing in the way to prevent them from at once joining their several families. There can be no good reason why their papers might not be sent to them by Post. But what is the case at present? That they are kept waiting for it for days together; loitering about, losing their time, and exposed to all kinds of temptation and expenses, and all this for no pay whatever. This should be remedied as it is in Her Majesty's Navy.

Then again Sailors' Homes are not yet what they should be; they are just large enough to provide for those seamen who actually belong to ships, a few merely who are living on shore, and even these, how far do they go towards supplying amusement and recreation for their inmates. They amount to nothing, and how are married seamen with families, how are all these provided for on shore. A good system of management is indeed required here. Our merchant seamen have yet to be considered in all their social relations, and those homes are required for married seamen as well as for the unmarried. It is hard enough to keep the young unmarried seamen on the *pavé* dangling about for his pay, but it is outrageous to keep the married man from his wife and family. And then again it would appear that sometimes Jack is lucky if he gets his wages without a piece of litigation to obtain them, such as the following reported from Liverpool.

"SEAMEN'S WAGES.—A case of considerable interest came before the Liverpool magistrates yesterday. The first officer of the ship *Plover*, Nathmoore by name, summoned the commander, Captain Doody, for payment of £19 3s. 6d., which sum he alleged to be due to him. The defendant shipped at Philadelphia last June for a voyage thence to Stettin, and thence to a final port of discharge either in the United States or British provinces. The *Plover*, however, put into Liverpool, and in that port Captain Doody, who it was alleged,

wished to get rid of the plaintiff, tendered him wages at the rate of 2s. 11½d. the dollar. The plaintiff refused to accept payment except at the rate of 4s. 2d. to the dollar, and with the consideration that the tendering of a wages account terminated the contract. After lengthy legal discussions, the magistrates awarded the plaintiff the amount claimed, the dollar to be valued at the rate of 4s. 2d., and the tendering of the wages to be considered as an end of the contract."

It is hard enough to have to wait for his wages but more so still to be brought to law for demanding them. But one of the most important subjects, and one of the first, which might well occupy the serious attention of a paternal government, is the forlorn condition of the laws on the subject of deep or overloading our merchant shipping. We have actually had proof, and that attended by a huge loss of life, of the utter neglect in which this subject has been allowed to remain. Is this deep loading system to be continued, or will the Legislature put a stop to it. Merchants have a right to do what they please with their own, but have they a right to its almost intentional loss which they know how to recover, have they a right to sacrifice seamen and passengers wholesale?

Was not the *London* allowed to go to sea in an overloaded condition, which no one could lawfully prevent that saw her sail from Plymouth. Was not the *Utopia** taken to sea from Liverpool by a captain who had taken her from another who would not sail her (knowing well the condition she was in), almost on purpose to be lost. Are not these glaring instances of the defects of our laws sufficient—both ships were lost, and in the case of the latter with no loss of life, but in that of the former some 150 persons perished. Are not these losses of life sufficient to secure the attention of the government to this dark subject, or must we still go on and see the same occurrences year after year till we are pointed at among the nations as the most reckless of the lives of seamen, because we find those of all nations sailing our ships, and because our merchants can recover their property from the Insurance Office—for as long as there are bad laws there are plenty of bad men who will profit by them.

Surely the safety of our own seamen is worthy the attention of the Legislature, notwithstanding our trading propensities have allowed two-thirds of our British crews to be substituted by foreigners. But our passenger ships—surely there is enough of English subjects in them to prevent them from being sent to sea as the *London* was. Bad enough she was in point of lading, but not too bad to be insured; or, is the game still to go on, and the shipowner to be left to speculate between his unworthy craft and the Insurance Office, by sending her to certain perdition at sea, and being enabled to produce another from her loss by that most considerate of all offices, the Insurance Office!

But we hope not; we trust that these things, among others, will be rectified in the measures which we are promised, shall be made to consolidate the laws relating to the Mercantile Marine before this

* See p. 380 of our July Number.

Session of Parliament shall have passed away. And we will conclude these remarks with the following extract from the *Hampshire Telegraph* on the part of our subject relating to seamen's wives and families.

The *Daily News* having, in an article on the Abyssinian expedition, asked, "What is to be done with the wives of our soldiers who are about to proceed on the expedition," and expressed the opinion—in which all will agree—"that it is a great and crying evil which calls aloud for redress, that we treat our soldiers' wives and children so perversely, so cruelly, and so wickedly as we do now."—Mr. Edward Palk, of Southampton, writes as follows, to the Editor:—"To show that your suggestion is capable of being carried out I may instance the Peninsular and Oriental Company of this town, who, instead of putting out much of their work to contract, engage the widows of those men who have died in their service in making many of those articles which are needed for their ships' furniture, and paying them 10s. a week for their labour. Through the liberality of one of the directors, Mr. Anderson, there is one of the best appointed schools established, at which the children of their men are educated in all that is necessary to make them useful members of society in after life; so that if a company can thus inaugurate a system so good and so useful, surely a great nation like this may well be expected to do somewhat to mitigate the anxieties of those who go forth to fight our battles in foreign climes, by caring for their wives and children that they leave behind.

"The Queen, in her speech delivered on the opening of the last parliament, adverted to the condition of the Mercantile Marine, and said that 'complaints had been made that the supply of seamen is deficient, and the provisions for their health and discipline on board ship are imperfect. Measures will be submitted to you with a view to increase the efficiency of this important service.' As a magistrate of this mercantile town I have had constantly brought before me cases of seamen who have been left sick in our colonies or in some hospital on some foreign station. On their recovery they are sent home by our consuls, and landed here without money or friends.

"According to the present state of our laws there is no mode of sending these poor fellows to their homes except by pauperising them, and this to a great portion of them is so repulsive that they will do anything rather than submit. But as there is no other mode they are eventually brought to this degradation. Feeling that this may be one of the many causes which hindered men from entering the mercantile navy, I addressed a letter to our mayor, who was presiding at a meeting at our Sailors' Home, and I sent a copy to those whom I supposed would have been engaged in drawing up the bill for the better providing for the men, and to render the service more acceptable. But nothing has been done in the matter, and we have lately had the same sad scenes taking place with the sick seamen landed here which formerly prevailed, so that if you do not press the subject of the soldiers' wives upon those in authority to carry it out I am afraid that there will be no attention paid to the earnest appeal you have made in their behalf."

If such things be allowed to continue we shall find our merchant seamen forsaking their ships in earnest. They will see clearly enough that they are not cared for: their property is nothing, and their lives looked on as nothing likewise. Our merchants may get their foreign seamen, as they can, to sail their ill-found, rotten, leaky craft, and they may go to the bottom. But the English seaman will be found elsewhere. He can find out as well as anyone else where he and his services are appreciated as they should be, he will be serving other masters, and his old ones, when the time comes, when they want him will not find him. Our only seamen will be our men-of-war's-men! Then let England keep up her trade as she can!

THE VIRGIN ISLANDS AND THEIR HURRICANE.

So the absurd report that the Island of Tortola had sunk to depths unknown has vanished before the light of truth. There was an amount of vagueness about it which, in our estimation, at once stamped it as "very like a whale."—It was first fairly gone; then it had only a temporary submergence of about eight hours, this was perhaps twisted from its eight thousand inhabitants; then the report had come from Havana *via* New York, enough in itself to set doubting at work; then the British consul at Cuba "has declared his belief that the news of the submersion of Tortola is much exaggerated;" and then it appears that all that is known of Tortola is that a great fire has occurred there, and that a family named "Sinclair Briart has been drowned." How like the story of the three black crows! Tortola was in the path of the hurricane, and so was Isle St. Thomas, and which has suffered most. The town of the latter is in ruins,—of the West Indian mail steamer *Rhone*, of one hundred and forty-five passengers twenty-five only are saved, five steamers, and sixty vessels are wrecked, including a French steamer; and the loss of life is estimated at five hundred persons.—At Tortola, a single family! So much for reports.

But under this rumour of the disappearance of the principal island of the Virgin Group the appearance of an American island has been realized,—a fact which will hereafter have no small influence in that part of the world. We have not lost Tortola by an earthquake or a hurricane, but the United States government has acquired, for a consideration, from the Danish, the possession of St. Thomas. This is conveyed in the following extract from the *Daily News*:

"The Danish islands of the Virgin Group have hitherto been of little political consequence in the hands of a distant and feeble government, but in those of a great maritime Power they must immediately assume importance. Lying at the very gate of the Caribbean Sea, the Power which holds them will bestride the highway from the Isthmus of Panama, and command its communications with Mexico, Central

America, and the whole West Indies. The policy of the government of the United States since the great civil war has led it to seek territorial aggrandisement for the purpose of strengthening its political position. It can hardly be doubted that the unexpected manifestation of the desire of Europeans for the dismemberment of the Union has done much to stimulate this decision. The purchase of Russian America had its precedent in that of Louisiana, but did little more than remove the flag of a European Power from the American continent. It has been understood on both sides of the Atlantic as denoting the intention of the government to take measures gradually, and as opportunities offered, to obtain complete control of North America, but its material value was very small. On the other hand, the islands just acquired give the United States an admirable naval position, besides enabling the enterprising citizens of the Republic to compete with Europeans for the valuable and increasing carrying trade between the island of St. Thomas and the islands and countries west of that purchase. The acquisition of an outlying territory not capable of physical incorporation with the Union, is a new thing in the history of the Republic, which has no colonial system, and the islands will probably form a new State. The negotiations for the purchase of the Bay of Samana, which have from time to time been mentioned as in progress, have probably been abandoned, as being rendered unnecessary by this transaction with Denmark, which, moreover renders less improbable the report that the United States government is seeking to obtain a naval station in the Pacific."

A naval station in the Pacific! We thought the Americans had one at San Francisco long ago; and still have it! Are they looking out for the Sandwich Islands, or Vancouver's? Which? The latter is directly between their States and the late purchase from the Russians. We find the following account of the St. Thomas affair in the *Daily News*, under the head of Denmark:

"Copenhagen, Nov. 3.—It is stated that a treaty has been signed by the Danish Minister for Foreign affairs and the American Minister at this court, for the sale of the Danish West Indian Islands to the United States for 14,000,000 rigsdalers, provided that such treaty be approved by the Rigsdag. The transfer of the islands to America will shortly take place, for which reason the president of the West Indian Islands, Herr Rothe, has received orders to return. It is not yet known whether a plebiscitum of the islands is also a condition of their transfer."

Perhaps after all the rumoured disappearance of Tortola may have originated in the above transaction to be approved by the "Rigsdag."

Let us now turn to the hurricane itself.

By the accounts of the hurricane, brought home by the *Douro*, it appears that the centre of it travelling in the usual W.S.W. direction, passed immediately over the Virgin Group. On the 29th of October, at eleven a.m., at St. Thomas, the wind is reported as blowing a fearful hurricane from N.N.W. $\frac{1}{2}$ W., the wind all the morning having been from the northward. By eleven a.m., the wind at N.N.W. $\frac{1}{2}$ W., the

barometer was down 27.95. At 12h. 15m. the wind had lulled, and at 12h. 30m. it was almost calm, and at 12h. 40m. it was almost dark. Shortly after a most fearful rush of wind from S.S.E. $\frac{1}{2}$ E. set in, and it continued to blow (how, not said), but with gradually diminishing force till four p.m. During this interval a great deal of mischief appears to have been done. But it thus appears to have been travelling on an E.N.E. and W.S.W. line, the focus passing over Tortola and the harbour of St. Thomas with the usual lull. The mention of two hurricanes is evidently by an inexperienced person, who seems to be quite uninformed on the principle of the rotatory gales. In point of duration it is a mere transient gale (a day and a half or two days being not unusual with these hurricanes, while this has not lasted half-a-day). However the violence of it seems to have made up for its brevity.

The *Douro*, which was to arrive at St. Thomas about the 29th, the day of the hurricane, is stated to have been two hundred and fifty miles from the island when it took place, and arrived out at St. Thomas just as the hurricane had ceased. The first notice she had of it was in seeing the funnel and mast of the *Rhone*. The Royal Mail Company's steamship *Wye* was totally wrecked on Buck Island while attempting to put out to sea. Out of seventy men only thirteen of her crew were saved—among them were five whites, including the captain, the chief officer, and the boiler maker—all the rest were drowned. The captain was on board the *Tyne* at the time.

The *Rhone* was wrecked off Salt Island, twenty-five miles from St. Thomas, while endeavouring also to get out to sea. She was driven on to a reef and broke up. The captain and all the officers were lost, and only one passenger and twenty-three of the crew were saved. The passenger saved from the *Rhone* was an Italian gentleman. He was six hours in the water. His name is not known.

When the gale commenced, the *Rhone* was lying at Peter Island, with the *Conway* alongside, transferring cargo. Circular blasts of wind struck the vessels with such force that the *Conway* was immediately blown ashore, and lost her funnel, etc. The chief steward, her cargo, and her specie were saved.

The *Conway* was blown ashore at Tortola, where she lost her funnels and masts, but was otherwise uninjured, and may be got off. After the *Conway* was on shore, it continued to blow, but with gradually diminished force, till four p.m. The Italian gentleman saved was from Pennsylvania. Mr. Hodgson, chief officer of the *Wye*, who was one of the saved, has had an arm broken in two places. The *Derwent* was blown ashore from her moorings in St. Thomas harbour, and much damaged. The *Tyne* and *Solent* rode out the gale at Paper (Query Water) Island, at anchor with their engines working a-head. The *Tyne* lost her foremast, and the *Solent* all three masts. None of the crews of the *Conway*, *Derwent*, *Tyne*, and *Solent* perished.

During the hurricane the *Vasco Nunes de Balboa*, a Spanish war vessel, was dismasted in St. Thomas harbour and otherwise damaged, but was able to steam about the harbour, saving as many lives from the other damaged vessels as possible.

The loss of the *Rhone* is thus described—The *Rhone* tried to ride out the storm at anchor, but her cable broke. She then tried to proceed to sea under full steam. In going out a terrible blast of wind struck her and carried her on to Salt Island, her stern first taking the rocks. Shortly after an explosion occurred in her engine-room, which it is supposed blew out her bottom. (This seems to have been the principal cause of her great loss itself.) She directly parted amidships, doubled up, and went down in deep water so suddenly that all below went down with her. The last seen of Mr. Morrish, the purser, was at the wheel with Captain Woolley, endeavouring to bring the ship up to wind. There were about twenty-two passengers on board the *Rhone*; two only of this number were saved.

It is estimated that upwards of six hundred persons were drowned at St. Thomas during the hurricane, which commenced at eleven in the morning and calmed by three in the afternoon. Within forty-eight hours three hundred bodies were washed ashore, recovered and buried. They presented a fearful spectacle, from the fact that they had been partially devoured by sharks and other fish. The smell in the harbour was most offensive. The bodies of Dr. White and Chief Officer Topper were picked up and buried, and Mr. Cameron, the company's agent, offered a large reward for the body of Captain Woolley, which had not been recovered. It was thought that on board the *Rhone* more were killed than drowned through the explosion and breaking up of the ship. Captain Taylor, of the *Wye*, was on shore on leave of absence at the time of the hurricane. The damage to property ashore was great, and the loss of life is estimated at from one hundred and fifty to two hundred persons.

It was the second part of the hurricane that drove the *Rhone* on the reef, which she took about midships.

The first striking shivered almost everything fore and aft. The second striking broke her in two, and everybody was thrown among the *débris*. The persons saved were washed ashore on masts, hen-coops, etc. The *Rhone's* mails that had not been put on board are brought by the *Douro*.

The leading features of this calamity appear to be confined to the great loss of shipping, and the destruction of houses in the islands of St. Thomas and Tortola. The loss of life has mainly occurred among the crews and passengers of the vessels. On shore many people have been killed by the falling of the houses. At St. Thomas and Tortola considerable damage was done along the shores of the harbours by the high seas that prevailed during the hurricane, but the loss of life through the waves among the people on shore was very small. On the sailing of the *Douro* the islands had scarcely begun to recover from the disasters; so much damage had been done in connection with all the ordinary channels of business, that its usual course was effectually stopped. The merchants' offices, official offices, and printing offices, were so wrecked that anything like an attempt at a clear description of the loss sustained in life and property, and damage done, had as yet been but very roughly carried out. The life at St. Thomas, in

the harbour and on shore, and among the shipping at sea, on the day of the hurricane, near the island, was considered not to exceed five hundred, while that at Tortola was believed not to have exceeded one hundred. Of about eighty vessels known to have suffered more or less from the hurricane in the harbour, every effort had been made to ascertain their names, and the list brought by the *Douro* was considered to be generally correct, and to embrace all that could possibly be discovered up to the day of her sailing. Some of the vessels that were believed to have foundered there was but slight hopes of identifying, either from their not having been reported at the islands, or being known when seen off. Amid the confusion of wrecks, when a panic prevailed also on shore, the assistance to the wrecked vessels unfortunately could be but very limited, and the loss of life was consequently very heavy among their crews and passengers. On the subsiding of the gale everything was done that could be carried out with the means left to ameliorate the disasters. The Royal Mail Company's wharves, coal sheds, etc., suffered badly, but the *Douro* was able to coal.

After the hurricane had lasted some time there was a lull for about half an hour. It then recommenced with redoubled fury, and lasted altogether three hours. The *Rhone* parted amidships, and the waves ripped the gigantic steamer up just as if she were made of brown paper. A gentleman who has come home in the *Douro*, saw two hundred and ninety-two persons buried at one time at St. Thomas, and soon afterwards there were fifty more ready for interment. One small bay he saw crammed with dead bodies which had been washed ashore. At Buck Island, where the *Wye* was lost, the shore was strewn with the remains of ships broken into such small pieces that all identity was destroyed. Captain Taylor, of the *Wye*, was providentially saved through not being on board his ship at the time of the hurricane. He is left behind at St. Thomas. TORTOLA HAS NOT BEEN SUBMERGED, but everything has been destroyed on the island by the fury of the hurricane, and the people were likely to suffer from starvation. Her Majesty's ship *Doris* has accordingly conveyed provisions to the island. The *Derwent* is not wrecked, but seriously damaged. The *Tamar*, which will bring the next West India mail, will be late home. All the Royal Mail Company's property at St. Thomas is destroyed. The damage they will sustain will amount to half a million sterling. No such tornado has ever been known. *Lighthouses are blown down*, the damage to property at St. Thomas is immense.

The *Wye* was blown right round by the hurricane, and went down. The *Douro* was two hundred and fifty miles from St. Thomas during the hurricanes. She felt the swell occasioned by them, and the horizon was very dark. The *Vasco Nunez de Balboa*, a Spanish war steamer, had fifteen of her crew blown off her decks. During the time the *Douro* was at St. Thomas daily communication was kept up with Tortola. In consequence of the inconvenience of having so many bodies to inter at St. Thomas, some of them had been burned.

Since the foregoing extracts were made further and fuller accounts of this very disastrous hurricane have been received. Our limits preclude the possibility of going into the sad particulars of all the loss of life that it has occasioned, authenticated lists of which will be made known hereafter, for they have spread distress and want far and near, but especially about Southampton. To the relief of this we have no doubt our readers will contribute as we do ourselves. But we have selected some of the accounts, especially the following letter of Captain Vesey, of Her Majesty's ship *Doris*, and the extracts of a letter from an officer of the *Douro* who seems to have known St. Thomas well, and contrasts its appearance on his arrival after the hurricane with what he remembered it to have been previously. It is a remarkable fact, but one that is peculiar to the hurricane, that notwithstanding St. Thomas suffered so severely, the Island of Santa Cruz not more than twenty-five miles to the southward knew nothing about it !

St. Thomas, Nov. 5th.

I arrived at this place at two p.m. on the 3rd instant, and regret to have to confirm nearly all the statements already made in this report, respecting the damage done.

Seventy-five vessels have been wrecked or seriously damaged ; property to the amount of about a million and a half or two millions has been lost, and about five hundred lives have been lost, including those wrecked in the mail steamers.

All the islands appeared as if fire had passed over them—the town of St. Thomas looks exactly as if an explosion had taken place ; roofs, doors and windows having been blown away, and the streets are filled with tiles, trees, and rubbish. The harbour is full of wrecks, and the dock, which some time ago went down suddenly, has had nine vessels against it, and several are sunk at one end of it at the present moment. The West India and Pacific Mail Company's steamer *Columbian* is one of them, with £400,000 of cargo on board. The great ship *Britisk Empire* (formerly the *Demerara* steamer) is one, and outside her are, I believe, several other vessels. The Royal Mail steamer *Derwent* is in eight feet of water, with an American ship alongside her. Inside them are the *Robert Todd* steamer (*La Guayra* packet) and a Spanish steamer, the latter quite destroyed ; another Spanish steamer is near wrecked I think, and a third, a man-of-war, lost her masts and went to sea. The French steamer *Caravel* has lost masts and funnel ; all tug boats and the dredging machines are on shore, and vessels' masts are sticking out of the water in all directions. The *Douro*, which brought the mails out, is coaling to take them home ; 1,600 dollars were offered for a gang of a hundred men for one day's work, but not one could be obtained, as the blacks have struck work.

The *Solent* takes the mails west : she was off Flanagan Island, and had her foremast blown away. I transmit herewith a copy of her log, which I have obtained. The Royal Mail steamer *Tyne* was there also, and cut away her foremast. She is running the windward mails ; I have offered the service of the *Niobe*, but if the commodore at

Jamaica can send up the next home-bound mail, she will not be required.

I called upon the governor of St. Thomas on the 3rd instant, when he expressed a wish for a diving apparatus, as all the dresses and hoses have been lost. I granted to her Majesty's acting consul the use of the one at Antigua yard, for public service, provided the West India and Pacific Mail Company engaged to replace it in two months, which they have promised. There is sufficient hose to work two dresses, and it is an object to get the bodies out of the wrecks.

The United States steamer *Monongabela* was at Santa Cruz (twenty-five miles off) during the hurricane, and did not feel its effect:—Commodore Bissell has rendered every assistance in his power to British interests, and towed a dismasted English vessel in here.

I have seen one of the survivors from the *Rhone*—John Metcalf, able seaman—Royal Naval Reserve, who was an invalid from a merchant vessel at Trinidad. From his and other accounts, I learn that the *Rhone* tried to weigh, that the shackle of the cable caught in the hawse pipe and parted; that she then tried to steam to sea; that steaming full power head to wind, she went astern on to the rocks at Salt Island, heeled over, and then broke in two, the passengers (one hundred and thirty), who were lashed on deck, being swallowed up in the chasm. Amongst them I regret to say were Dr. Henry Arnot, late surgeon of this ship; Isaac German, late able-bodied and leading seaman; Charles Peek, able-bodied; and Benjamin Hough, private Royal Marines, eighty-eighth company of Woolwich division, who were invalided from us, and left Barbados on the 26th October.

The survivor (Metcalf) swam to the foremast, and was taken off the fore topsail yard next day at about eight a.m. The *Rhone* went on shore about two p.m. I think about one hundred and thirty were lost in her (all passengers); there was one Italian saved, and a Mr. and Mrs. Gibson; and Mr. and Mrs. King, of Barbados, are included amongst the lost—the body of the latter is supposed to have been picked up. All the officers of the *Rhone* were lost, and only about twenty-five people (crew) saved, including the boatswain.

The *Wye* left St. Thomas in charge of her chief officer, the captain being on shore; she steamed about fifteen miles to the westward, when her compasses became useless from the amount of electricity in the atmosphere. The darkness was so intense, although it was mid-day, that at last she ran on Buck Island, to the eastward, and in fourteen minutes had disappeared. About sixty-five were drowned, and about eleven saved, including the chief officer who had his arm badly broken. I have since heard that nearly fifty bodies are in a small bay on Buck Island, which cannot be approached for sanitary reasons.

I have written this letter in a very hurried and disjointed manner, as the mail steamer *Douro* sails this evening. I have much to do, and am obliged to get information as I can.

I start to-morrow (Nov. 6) with a piece of temporary funnel for the *Conway* at Tortola, and I shall carry a quantity of planks, etc., which

I have bought at the public expense, for the purpose of housing the inhabitants of Tortola and the Virgin Islands, who are British subjects.

I feel confident that I shall be borne out in incurring any fair expenses, but nothing can ever be repaired by them. The consul here has also sent up provisions, and if proper care has been taken to send assistance to the outlying islands as I pointed out, and the boats picked up on the reefs have been used, no case of starvation need occur. I shall visit every place myself where I can, and punish wreckers and plunderers without ceremony.

With reference to the hurricane, I can only say now that it occurred after the season was supposed to be over, as the first full moon in October was on the 13th. It was the fourth hurricane or indication of one which we have had during this peculiar season.

After the storm experienced by the *Doris*, at St. Kitts, on the 28th July, reported to their lordships through the hydrographer, I informed the Commander-in-Chief that I considered we could not be sufficiently careful as the hurricane appeared to be increasing in intensity. The season has been wet, and very sickly. Seven inches of rain fell during the night of the 7th October at Barbados, and on another night five inches fell.

On the 29th October, the *Douro*, outward bound, experienced a heavy swell, and a southerly set. We, also at sea, off Guadaloupe, had a heavy northerly swell, but nothing more.

When the hurricane passed, the barometer gave no warning, though the weather did, and all thought it was to be a norther.

The barometer fell and rose during the breeze, and the vortex passed directly over these places. It seemed to be travelling slowly to the westward; the thunder was terrific; shocks of earthquakes were felt, and the electricity was so intense that compasses were useless; darkness set in, and vegetation was destroyed. The sea water was caught up—the particles, here called “hail,” have injured people, but this perhaps may be thought improbable. It will be observed that vessels’ masts were literally blown out of them, and that a fourteen-knot steamer was blown astern and wrecked, when steaming full speed ahead.

I need not cite further instances of the power of the gale; all the vessels that tried to go to sea were lost, with nearly all hands; and an American ship (blown out of this harbour) has foundered. The whole of this ruin and devastation occurred in the space of two hours.

I earnestly submit for their lordships’ consideration whether the system lately adopted of keeping her Majesty’s ships at sea during the hurricane season is a good one, and can only say that my own opinion, after fourteen years’ experience in the West Indies, is that no man-of-war could have weathered such a blow if caught at sea, and that these islands, for the next two years, will be liable to similar visitations. As far as I can learn, this hurricane has caught Anguilla, Virgin Islands, Tortola, St. Thomas, Culebra, and the north-west end of Porto Rico. It was going direct for Turk’s Island and the Bahamas.

I transmit herewith a list of ships lost or damaged, as near as can be ascertained at present. The lighthouse at the battery has been blown down, as reported by the consul (copy of letter enclosed). I have already sent a copy of this report to the hydrographer, and to the commodore at Jamaica.

I have just heard a rumour that Beigne or Crab Island has been struck, and that part of the hurricane passed south of Porto Rico. I believe that yellow fever is still very bad here, but I cannot obtain any accurate information at present. Those men left on board, who had fever some time since, are suffering much from debility, but I cannot invalid any by this mail.

Commanders Parry and Smythet have gone to Jamaica by the *Solent* this morning. I wish to call attention to the enclosed list of vessels lost, etc., which is as correct as possible.—I have, etc.

C. VESSEY, Captain and Senior officer, Barbados Division,
North America and West Indies.

The following extracts are taken from a letter from an officer of the *Douro*, dated St. Thomas, November 5th: "Very peaceful and very beautiful looked the town of St. Thomas when first sighted at about 4 o'clock in the afternoon of the 30th of October from the deck of the *Douro*, the steamer from Southampton on the 17th of that month. Delightful had been the run during the morning, as with all sails up to royals set we had steamed by the low rocky beach of Sombbrero, an island without a tree, and inhabited only by a few miners—then bold bluffs and the reefs of Virgin Gorda, and having coasted the chain of islands which includes St. John's, Tortola, and Peter Island, at last we let go our anchor in the outer roads of St. Thomas, at a distance of about two miles from the town. First impressions underwent a sad change when we got sufficiently near to see the harbour strewn with wrecks, the lighthouse gone, and many houses roofless.

A confused mass, near the middle of the harbour, built up of crushed hulls, broken spars, and loose cordage, was formed by the ship *British Empire*, lately out from England with 3,800 tons of coal for the use of the steamers of the Royal Mail Company; alongside her was the steamer *Colombian*, belonging to the West Indian and Pacific Steam Navigation Company, in from Liverpool but half an hour before the awful crash came, with a cargo valued at more than £200,000, and now shewing nothing but funnel, masts, and rigging above water; right underneath these two were a French bark and a brig. Nearer to the shore lay the Spanish war steamer *Nunez de Velasco*, and a French mail steamer. These two alone out of the many vessels lying in the harbour lived through the hurricane, having cut away their masts, and trusted for safety to the strength of their cables, chains, and anchors.

Against the floating dock was the American brigantine *Nellie Gay*—a pitiable object, every mast and spar either carried overboard or lying on her deck. The floating dock itself, just approaching completion, would in a few weeks have been available for docking and repairing, but in common with everything else belonging to this ill-

fated town, it has met with accidents, the *Nellie Gay* and the *Colombian* having been driven against it. Dotted over the harbour were masts showing a few feet above water, marking the spots where the various schooners and other craft had gone down; and on the beach all round lay other vessels, hurled by the force of wind and wave far upon the land, some positively in the streets of the town. A further survey showed more accidents and equally terrible casualties. Round the island, to the left of the town, looking from the sea, lay in one cluster five very large steamers, including the *Derwent*, belonging to the Royal Mail Company, so crushed together that to distinguish masts and funnels proper to each was impossible. At a distance of a quarter of a mile lay one funnel thrown across and resting on the deck of a large ship, some feet of whose stern had been cut away sharp and square, showing her decks in section. But cases like these appeared everywhere.

No sooner was the *Douro* moored than anxious inquiries rose on every side as to the fate of the *Rhone*; also of the *Conway*, the *Wye*, the *Tyne*, and the *Solent*, steamers of the Royal Mail Company. The *Rhone*, appointed to carry the homeward mail of the 30th, had, it appeared, gone to Peter Island, about 20 miles away, in consequence of fever having made its appearance at St. Thomas, leaving the branch steamers to join her there and effect the transfer of passengers, mails, and cargo. Strong fears for her safety were felt, and the *Conway* was believed to have run on shore at Tortola. About eight o'clock the same evening news came. The *Tyne* sadly crippled, her foremast and its rigging lying on its deck, steamed into the harbour; the *Rhone* lost, and with her one hundred and fifty poor souls hurried into eternity; the *Wye* lying in splinters on Buck Island, out of her ship's company of nearly sixty but six survivors. Such were the horrors of which the *Tyne* brought word. Eager were the questions asked of the seamen rescued from the *Rhone* who sadly paced the deck, walking like men in a dream, so awful had been the shock of what they had gone through. Their fate was short. During the lull which occurred at all places over which the hurricane passed, at about one o'clock, the *Rhone* put out, she had safely passed through a rocky channel leading to the open sea, but one more point to round and she was safe, when in a moment from the S.E.—whereas previously it had blown from the N.W.—the cyclone came down upon her with even more dreadful energy than ever. Twice she struck, and boats and spars and sheep-pens flew across the deck, then she parted amidships, the stern portion swung round, and, the waves rushing in between her decks, ripped them up as though with an explosion of gunpowder.

At the time the hurricane commenced the *Conway* lay alongside the *Rhone*, engaged in transferring passengers. Seven or eight had passed over, and one was heard to say to his wife, 'Thank God, we are safe here.' The large ship now lies a wreck upon the shore. The smaller one, there is reason to hope, will to-morrow drop anchor in St. Thomas harbour, not a life having been lost in her! Of the scenes of desolation and destruction which met the eye on landing it would be impossible to give more than a very faint idea. The wharves which used to line

the shore were gone, and every street blocked up with broken rafters, zinc roofs, bricks, boughs of cocoanut palms, household furniture, and *débris* of every conceivable kind. Houses even were to be seen standing erect which had been lifted from their foundations many yards distant and dropped into some of the lanes running seaward out of the main street.

In one lane were to be seen, among tons of broken wood, an anchor, several cart wheels, a pianoforte, and several slabs of marble, which, when the storm was at its height, had been seen whirling round in the air like sheets of paper. A bombarded town could never have presented a worse picture of ruin and desolation. Plantations of whitened sticks covering the hills alone indicated that trees had at one time grown there, and of the palms which had graced Cocoonut-square and the approach to the Lutheran Church but few torn fronds still clung to their native stems. At various points along the beach crowds of people were collected, and from each was carried away with dreadful regularity strings of rough coffins containing the dead which the sea gave up. By four o'clock on the 30th two hundred and ninety-two bodies had been washed ashore and buried, and the systematic way in which the people worked under the guidance of the police was a sad proof of the practice they had had by that time at this mournful occupation.

At St. Thomas, the hurricane appears to have commenced at ten minutes past twelve, and to have lasted with one break—at one o'clock, lasting thirteen minutes—till half-past three. The barometric indications of its coming were feeble until it had absolutely broken; then the downward progress of the mercury could be distinctly seen. One or more shocks of earthquake were experienced, and in a moment the awful conflict had begun. So dense was the body of the rain and spray which rushed through the streets, that objects twenty yards away were rendered invisible by it, and persons seeking their homes and families held on to lamp-posts, door-handles, or whatever promised temporary security, uncertain which way to turn in the darkness. At one o'clock the storm blowing from the north-west ceased, and the thirteen minutes' lull took place. Again it broke forth with more dreadful energy from the opposite quarter, and tore away many vessels which had till then ridden securely. The harbour master and an officer of the *Nunez de Velasco* vied with each other in their heroic efforts to save life. Sad to say, the former perished; the latter only escaped in an almost miraculous manner, for his boat being capsized he himself was thrown upon the beach, and there lay till the day following before being found."

Mr. Holdeman, a warrant officer, living in Melbourne-street, Southampton, has given the following personal narrative:—"We were in a N.W. gale, blooming fresh, when we parted our cable with sixty fathoms in the hawse, and steamed away to sea. After steaming for perhaps an hour it became clear, and in fifteen minutes we found ourselves close to the shore. The captain then gave orders to turn astern, which we did immediately, and cleared the point. We proceeded steaming through the gut, and met a south-east wind

blowing fearfully heavy. It then became very thick indeed, so that we could not see anything scarcely—not a ship's length. We had been steaming about two hours, when I reported to the captain that there was land very close indeed, nearly abreast of us, midships on the port hand. With that the ship went ashore immediately. The captain said to me, "Good Lord, is it ever possible?" and I replied, "Yes, sir, the ship's ashore." The captain never spoke to me again, and shortly after a sea struck him in the side and washed him over to the top of a skylight. The next sea took him between the ship's side and the rocks, and I saw no more of him. A sea struck me, and finding I was getting exhausted, and could hold on no longer I loosed my hold.

The chief officer, Mr. Darby Topper, was killed by a spar, about an hour before this, and I saw no more of anyone, for I was washed overboard myself. I and five other men were saved by clinging to a hammock bin, which contained seamen's hammocks and floated. About eleven o'clock at night, as near as I can suppose from the darkness, I was washed ashore; all my clothes were washed clean off me, and I had nothing but a pair of drawers and a shirt on when I landed on Beef Island. We remained there all night. I went and saw the governor next morning, and he provided me with a boat. We got assistance from Tortola by a man named Smith, who took us on board the *Tyne*, in Tortola Bay. From there we went to St. Thomas, and got on board the *Douro*. It may be of interest to know that a boy named Bailey floated ashore on a life-buoy, which he has kept. He was on a coral reef there all the night, and the next morning joined us on the island where we were, and he has brought home the buoy with him. Four boys were saved: one the engineer's, one the chief officer's, and the others ship's boys. I never saw one person drowned.

Henry Buckell, a fireman of the *Rhone*, living in Crown-terrace, Bevois Valley, said, "We struck on the rocks at Salt Island. I should think we were there for seven or eight minutes, when the chief engineer called us up from below, when the ship broke in halves, and I went up the skylight. I saw the sea break right through her side, and when I got on deck I saw the sea come right over her. I saw many persons rushing to the fore companion, and up through the skylight on to the spar deck, when I was washed overboard. I can give no further account until I found myself on Beef Island, where I got about half-past ten at night, I should think, and we were brought off from there to the *Tyne*. We had taken a few passengers out of the *Conway*, I believe, but I cannot speak positively. Dr. White joined the ship the day before, and his body we picked up and buried at Tortola, and all that could be found of Captain Woolley was merely the sleeves of his coat.

Rees, a fireman of the *Rhone*, residing at Freemantle, said, I went down when we commenced to light up the fires about half-past eight, when we were lying at Peter Island. Three fires were ordered in each boiler, and we had not been down half-an-hour when we were ordered

to light up another fire in each, making all the fires now lighted, and reaching fifteen pounds of steam. The gale freshened, and we were told to get up as much steam as we could. We got up twenty pounds—all that we could possibly give her, and she was going at full speed at the time she went down. What I fancy is, that when she struck first she “kind of scurged” a rock on the port side; the second time it seemed to lift her, and she went down “bump,” and bumped three or four times. Of course it drove her sides in, and I believe the rocks went up at the bottom into her boilers. Seeing the water coming into the stoke-hole, I got up through the engine room-ladder; all that I saw was a boiler maker in the engine-room, and he went up the ladder before me. When I got on the top, the steam pipe burst, and everything being covered with steam, I lost sight of all that was going on. As I knew the way out as well in the dark as in the light, I got hold of the handrail, and crawled under the steam out of the door. When I got out, I found the forward companion covered with people. The main deck people were clinging to everything they saw. I rushed right through them on to the spar deck, where I was washed off, and overboard, and the bows of the vessel came round to me. I clung to the foretopsail yard, where I stopped from one o'clock in the day until half-past eight next morning, when I was took off by a little punt, which picked up four besides me. It could take only two at a time. I was washed naked. I saw the chief engineer, Mr. Hooper, clinging to a skylight, and was washed by him. He looked at me, and I looked at him, just as men will do at such times. My opinion is that more were killed by the knocking about of the wreck than being drowned. The men in the stoke-hole had no chance to come up. Two came up but they were fearfully scalded; their names were Lane and Arthur Cull. The things in the gale were flying about like birds. I saw one lady clinging to her husband by the after companion, and I believe she was picked up next morning by the doctor of the *Solent*. The gale seemed to come on gradually, and continued getting worse. I did not apprehend danger before it happened, because I've often been out in roughish weather. I hadn't been on deck in the wind, but below, this did not appear worse than I've been out in before. I am a good swimmer, but the next morning the sharks were lying around us like little fish, and therefore 'twas useless to think of swimming in order to get relieved and picked up.

NEW BOOKS.

THE SAILOR'S WORD-BOOK: *an Alphabetical Dictionary of Nautical Terms, etc.* By the late Admiral W. H. Smyth, K.S.F., D.C.L., etc.

That change is the order of the day, every day confirms. The world itself is never still, always moving, and why should we mortals be exempt from the law? What an emblem of change is presented by

the navy of England ! By Byron himself when he spoke of the ship as :
"Walking the waters like a thing of life."

little thought that she would ever become what she is ; from perfection of symmetry in wood to a shapeless mass of iron ! Our veteran naval artist, Schetky, has snatched from the rude and swift current of time, the pictures of those models that have been condemned to the shades of oblivion, and he has preserved what he has well called the "Veterans of the sea," for our historic pictures ;—models never again to be realized, and here before us is the "Word-Book" of the language employed by those who manned them. Will this too pass away ? Doubtless it will ; step by step its vocabulary will gradually disappear from the surface of life, and leave but a few shreds of "words" behind.

However, for the day here is an account of things as they are, as full and complete as it should be turned out of the hands of even three veteran seamen ! We little expected to have met with the name of our old respected and esteemed chief mentioned in its pages. Yet he too had in view the formation of a nautical "word-book :"—the author of this has himself passed away, and the task of giving it to the world has been necessarily performed by another hand. In our former remarks, when we allowed a nautical expression to run away with all our space, we omitted to mention that the friendly assistance of Vice-Admiral Sir Edward Belcher has completed the labours of his late brother officer, Admiral William Henry Smyth. As the completest work of its kind, it has the first claims to the attention of the class for whom it is intended ;—inasmuch as it contains expressions employed by those who follow the profession of the sea, not only in regard to all the paraphernalia of the ship, but also as relating to astronomical and other technical matters with which the sailor has much to do. Is a term even obsolete, or out of use, though familiar with the veteran seaman of former days,—here it is, laid up in ordinary and carefully explained.

Admiral Smyth was a seaman of the old school, and being besides a scientific one as well, he was well aware of the importance of preserving these idioms of every kind ; and he therefore made room for them ; although he did not descend to the slang of the galley, as seems to have been required by a shore-going print, that has sadly floundered in muddy shoal-water, owing to its sublime ignorance of nautical parlance ; learned as it may be among its literary composers ! But, perhaps, by this time it is enlightened, and knows something more of the "marine" whose history it complains of the Admiral for omitting ! But the Admiral knew well how to grace his pages with useful and desirable information, without disgracing them by slang ; and so we heartily commend his book to our readers.

TIDE TABLES. We congratulate those whom these concern, and they are "legion," on the appearance of this Admiralty work, the annual labour of Staff-Commander J. Burdwood, R.N. They are published by Potter, 31, Poultry.

Nautical Notices.

PARTICULARS OF LIGHTS RECENTLY ESTABLISHED.

(Continued from page 636.)

Name.	Place.	Position.	F. or Fl.	Ht. in Ft.	Dist seen Mls	Remarks, Bearings are by Compass.
71. Homlung	Norway on the South and West Coasts	... ..	F.	24	8	Visible from W.N.W. round by South to E. by S. $\frac{1}{2}$ S. Lighted all the year round.
Stabben		... ..	F.	54	12	Bearing W. $\frac{1}{2}$ N. the light will shew <i>red</i> . Lighted from the 1st August, to 15th May.
Kind Island		On S.E. end of Island	F.	33	10	Visible from S. by W. round by West to N. by E. Lighted from the 1st Aug., to 15th May.
Stot		... ..	F.fl.	24	10	A Guide to Stot from N. visible from East round by S. and W. to N.
Mandals Ryvingen		On S.W. end	F.fl.	135	18	The flash is <i>red</i> every half minute. To be Lighted 20th Oct., 1867.
Hatholm		... ..	F.	64	10	Visible from N. by E. $\frac{1}{2}$ E. round by W. and S. to S.S.E. To be Lighted 20th October, 1867.
Ohna Calf		... ..	F.fl.	143	18	Will be shewn from 20th October, 1867, a red flash every half minute, to denote vessels in the ice.
72 Skaw Light-house	Signals from	... ..	...	...	...	See Note (a).
73. Faludden	Gothland	56° 59' N. 18° 25' E.	F.	35	8	Est. October, 1867, S.E. end of Island.
74. Trieux R. on La Croix Rock	France N. Coast	48° 50' 3" N. 3° 3' 3" W.	Fl.	45	10	Est. 15th October, 1867. An eclipse and a flash will succeed each other alternately every four seconds.
Bodic	Ditto	... ..	Fl.	176	12	Est. 15th October, 1867. See Note (b).
75. Lian River Entrance	China E. Coast	Yellow Sea	F.	...	8	Light Vessel on N. Coast. See Note (c).
76. Bulk	S. Holstein Coast	54° 27' 5" N. 10° 12' E.	F.	96	14	Light Improved.
Friedrichsort	Ditto	54° 23' 5" N. 10° 11' 7" E.	F.	37	8	For Entering Kiel. See Note (d).
Flensburg	Ditto	... ..	F.	15	2	A fixed green light, also an additional fixed red light. See Note (e).
Sonderburg Sli	Ditto Sli	... ..	F.	...	...	Two fixed green lights. See Note (f).
77. Shell Cays	Marsh I. Louisiana	... ..	F.	...	10	At North Point of Entrance.
San Juan H.	Porto Rico	W. Indies	...	...	...	Destroyed in a hurricane, 3rd and 4th October, 1867.
78. Brindisi H. Naples Mole	Italy	Adriatic Mediteranean	...	...	...	Buoys laid down. See Note (g).
Lefchimo Point	Corfu	Ditto	...	...	...	A Mole constructing. See Note (h).
Kili	... ..	Black Sea	...	...	...	Est. 15th Oct., 1867. Transferred from Military Mole to Naples Mole, 280 yards from former position. See Note (i).
Karabournou	... ..	...	...	...	...	Light Vessel replaced, temporarily extinguished, see No. 57, p. 636
79. Nerva I.	Gulf Finland	60° 14' 7" N. 27° 58' 6" E.	F.	118	16	Lighthouse painted red } Note (k) " " green }
Isle Talaftons	Boko Sund	58° 51' 2" N. 17° 36' 5" E.	F.	...	...	Est. " " Viborg Bay.
Isle Ledskar	Orsbaken	58° 42' 2" N. 17° 14' E.	F.	...	...	To guide through Boko Sund. Visible from S. by W. to W. by S.
Femero	On S. side of a house	58° 39' N. 17° 7' E.	F.	...	...	To guide through the Orsbaken for Nykoping. Seen from N.W. by W. round by North to S.E. by E.
80. York Spit, York River	Chesapeake Bay	United States	F.	30	8	To guide Vessels across Brawiken.
						A Floating Light re-established. See Note (l) for position.

F. Fixed. F.fl. Fixed and Flashing. R. Revolving. I. Intermitting. Est. Established.

(a) The Danish Government has given Notice, that from the 1st day of January, 1868, the following signals will be hoisted on a mast with a yard, on the top of the old lighthouse on the Scaw, distant about 1700 yards W. by S. (by compass) from the new lighthouse, to denote that one or more of the light vessels in the Kattegat have been compelled to leave their station on account of ice or other causes, and the signals will be continued until the vessel or vessels are replaced.

No. 1. One ball on the masthead signifies that the *Trindelen* light vessel has left her station.

No. 2. Two balls below the eastern yard-arm signify that the *Kobber-ground* light vessel has left her station.

No. 3. One ball below the quarter of the yard on the east side of the mast signifies that the *Anholt* light vessel had left her station.

No. 4. Two balls below the western yard-arm signify that the *Læsø* channel light vessel has left her station.

The balls will be painted *red*.

The signals hitherto shown from the old lighthouse on the Scaw, as well as from the lighthouse on the Hirtsholm when the *Læsø* channel light vessel has left her station, will, from the same date, be discontinued.

(b) It is visible through an arc of 18 degrees, or 9 degrees on each side of the centre of the channel.

DIRECTIONS.—In entering the Trieux bring the two lights in one, and when the Bodic is hidden by La Croix tower, to an eye 8 feet above the level of the sea, open out the Bodic to the West and pass the La Croix on that side.

It is intended to place two red lights on the left side of the river, as a guide from the La Croix to the interior anchorage. The West coast of the channel is now marked by a bell buoy on the Plateau des Sirlots and by five stone towers painted *red*.

(c) The light vessel has three masts, and is moored in 5½ fathoms, with Tower hill bearing S. by E. ¾ E., ruined tower on Kae-chu point S.E. ¾ E., and the mouth of the river N.E. by E. ¼ E. Baskets are placed on the top of two of the masts; the Mizzen yard is always crossed, and from this mast signals are made. From the light vessel the two buoys in the river can be seen, one with the eye, the other with the assistance of a telescope.

All Bearings are Magnetic. Variation 3° 30' Westerly in 1867.

(d) The tower is round, 32 feet high, and is placed on the reef on the West coast of Kiel fiord, S.E. 50 yards from its extreme.

In foggy weather a signal from the mail steamer will be answered by sounding a bell.

Ships entering Kiel fiord should not pass within 50 yards of the light.

When the fiord is frozen over the light will not be exhibited.

(e) This light is exhibited from a pole, and is intended to indicate the position of the port of Flensburg, and when the mail steamer is expected, a *fixed red* light is exhibited in addition, which, being kept in a line with the green one, indicates the position of the channel.

(f) These lights are *fixed green* lights, bearing North and South of each other; the North light is elevated 19 feet, and the South light 15 feet, above the level of the sea, and in clear weather both are visible from a distance of 3 miles. They are exhibited from

in the Castle square, and when kept in line lead between the East and West points at the entrance of the port.

(g) The Spanish Government has given Notice, that the following buoys have been placed at the entrance of San Juan Harbour, island of Puerto Rico.

A *Bell and Safety Buoy* has been moored in $3\frac{1}{2}$ fathoms, at low water springs at the mouth of the port, close to the breakers of Cabras island, the lower part is painted *black* and the upper part *white*; above the bell is a glass reflector.

The body of the buoy is surrounded by an iron frame work to facilitate the preservation of life from shipwreck.

The buoy lies W. $\frac{1}{2}$ S. distant 3 cables from Morro point.

Western Bank Buoys.—Three smaller buoys, painted *black and white* alternately, have been placed on the western edge of the channel, near the entrance, in 14 feet water.

Morro Point Buoy is a large *red* buoy with a ball, in 15 feet water, on the edge of the shoal off Morro point, and lying S.W. $1\frac{1}{2}$ cables from that point.

Beacons.—Three beacons have been placed on the eastern side of the channel; they are surmounted by glass reflectors.

Warping Buoys.—Nine iron barrel shaped *black* warping buoys have been placed in the channel, rather nearer the eastern side than the western. These buoys are moored in from 6 to 8 fathoms, low water springs, and range from the entrance to abreast Puntilla. On each buoy is marked the depth of water in which the buoy is moored.

(h) Extending in a south-easterly direction from the Castello di Mare lighthouse, intended to be carried to a distance of 285 yards, 130 now completed; also that a *red* buoy with staff and flag has been placed E. by S. $\frac{1}{2}$ S. distant 285 yards from the same lighthouse.

(i) The Italian Government has given Notice, that since the 15th day of October, 1867, the light on the military mole at Naples has been removed to a tower recently erected on the extremity of the mole, and bearing E. $\frac{1}{2}$ S. distant 280 yards from the old position of the light.

The light shews a flash every three minutes; besides which a light vessel has been placed 62 yards off the new lighthouse, to mark the end of the mole in the course of construction.

This light is a *fixed green* light, elevated 30 feet above the level of the sea, and in clear weather should be seen from a distance of 2 miles.

The light vessel has one mast, surmounted by a globe painted with red and white bands.

At a distance of 142 yards from the new light, a buoy, surmounted by a globe painted with *red and white* bands, has been placed, to mark the extremity of the stones.

(k) The Turkish Government has given Notice, that for the purpose of enabling Mariners to distinguish the European from the Asiatic shore, in the vicinity of the entrance of the Bosphorus. they have caused the lighthouse of Kili to be painted *red*, and that of Karabournou to be painted *green*.

(V) The light-vessel is schooner-rigged, painted yellow, and is moored in 4 fathoms water, with the following bearings,—

New point Comfort lighthouse	..	N.N.W. $\frac{1}{2}$ W.
Back river	.. .. .	S.S.W. $\frac{1}{2}$ W.
Too's point	.. .. .	W. $\frac{1}{2}$ N.

The light is intended to mark the York spit, and to guide vessels bound into Mobjack bay and York river.

NAVIGATION OF THE CHINA SEA.—Dangers between the Fiery Cross and North Danger Reefs, in the main route of the China Sea, and shoals in the Palawan route, with remarks on the Paracel, by Navigating Lieut. John W. Reed, R.N., H.M. Surveying Vessel *Rifleman*, 1867.

All the bearings are Magnetic. Variation $1^{\circ} 20'$ Easterly, in 1867.

Discovery Great Reef.—South end in lat. $10^{\circ} 0' 7''$ N., long. $113^{\circ} 51' 5''$ E., bears E.N.E., 52 miles from the N.E. end of the Fiery Cross reef; it is a long narrow coral reef, most of which dries at low tides; several rocks upon it always show above water; in the centre is a shallow lagoon, with no passage to it through the reef. From the S. point the reef tends N., 5 miles, then N. by E., 5 miles; it is a mile broad at the S. end, and half a mile at the N. No bottom with 100 fathoms at a very short distance from any part of it except its N. end, where the *Rifleman* anchored in 42 fathoms, nearly half a mile from the rocks; at a third of a mile off the S.W. point 192 fathoms sand and coral was obtained.

The Hainan fishermen report a shoal 10 miles N.E. of *Discovery Great reef*, the locality not being examined should at present be avoided.

Discovery Small Reef.—E. $\frac{1}{2}$ N., $9\frac{1}{2}$ miles from *Discovery Great reef*, is in lat. $10^{\circ} 1' 5''$ N., long. $114^{\circ} 1' 5''$ E.; a small round coral patch, three cables across, partially dry at low tides, very deep water around, with 174 and 180 fathoms, sand and coral, found close to its eastern side, but on its western no bottom with 210 fathoms at the same distance.

Western or Flora Temple Reef has rocky patches just under water at its S.W. end, and 1 to 3 fathoms in other parts; its centre, in lat. $10^{\circ} 15' 15''$ N., long. $113^{\circ} 37' 15''$ E., is N.W. by W. $\frac{1}{2}$ W., $16\frac{1}{2}$ miles from the N.W. end of *Discovery Great reef*, and is the westernmost danger in this part of the China Sea. It is $1\frac{1}{2}$ miles N.E. and S.W., and above half a mile broad at the southern part, decreasing to half that breadth at the opposite end. The *Rifleman* anchored in 5 fathoms on its N.E. extreme, approaching it cautiously shoal water being seen just inside the edge; 18 and 74 fathoms were had close to, but at a short distance off, no bottom with 100 fathoms.

The reef on which the *Flora Temple* was lost in 1859 was said to be 6 miles north westward of the Western reef, but the *Rifleman* passed over that position, and certainly no danger exists there; moreover, the description of the reef given at the time of the wreck applies exactly to the Western reef, where, without doubt, the ship was lost. But possibly the invention had something to do with the insurance.

Tizard Bank, Reefs and Islands.—From *Discovery Small reef* the nearest part of the Tizard bank bears N.E. by E., 16 miles. It is very extensive, and, like large coral banks of the China Sea, has a lagoon bordered by shoal patches. Several patches of the Tizard bank are dry at low water, two having an island on them, and a third a sand cay. The bank takes a N.E. by E. $\frac{1}{2}$ E. direction, and the eastern limit not being yet determined, extends about 20 miles, its breadth at the N.E. part being 13 miles, and at the opposite end 7 miles.

Itu Abaer, the larger of the above islands, is at the N.W. corner of the bank, three-quarters of a mile long E. by N. and W. by S., and a quarter of a mile broad. The reef around it extends in some places to a short half mile, its limits being shown by breakers. The island covered with small trees and high bushes, is the resort of sea birds. Two or three cocoanut and a few plantain trees stand near a small well, the most conspicuous object being a single black clump tree, on the north side of the island, distinctly seen 10 miles off, the tree is in lat. $10^{\circ} 22' 25''$ N., long. $114^{\circ} 21' 45''$ E.

About 6 miles, East, from *Itu Abaer* is a small sand cay, nearly in the centre of a circular reef three quarters of a mile in diameter. The island and cay are connected by shoal patches, which form the N.E. part of the bank; and nearly midway between, but nearer the island, is a reef, covered at half tide, about the same size as that surrounding the cay. On parts of the northern edge of the bank there is not less than 4 fathoms, and vessels may safely anchor in from 7 to 11 fathoms about $1\frac{1}{2}$ miles westward of the sand cay, midway between it and the Tizard reef.

Namyit Island is due S. from *Itu Abaer*, $11\frac{1}{2}$ miles; is very small, 3 cables E. and W., and one cable broad, it is surrounded by a reef extending above a mile to the westward.

West of *Namyit* are two dangerous reefs, covered at high water; one oval-shaped, three-quarters of a mile long N.N.W. and S.S.E., bearing W. $\frac{3}{4}$ S. 6 miles; the other a mile long N. and S., is nearly three-quarters of a mile broad at its northern end, narrowing to a point at the opposite end; this is the westernmost danger of the Tizard group, and its outer edge is in lat. $10^{\circ} 13' 3''$ N., long. $114^{\circ} 13' 1''$ E.

These form all the dangers found on the bank, and, excepting a 3-fathoms patch about a mile off *Namyit*, 4 fathoms was the least water on any of the other shoal patches. In fine weather vessels safely anchor on any of them. The depths in the lagoon vary from 26 to 48 fathoms, it has four small patches, 5 fathoms being the least depth on them.

About the eastern limit of the bank, the Hainan fishermen report a breaking reef, which is probable that seen by Captain Eldad in the *Cacique*, being, however, far to the eastward of the proper track for vessels, where no Commander would be justified in venturing.

An island, named *Sin Cowe*, is said, by the fishermen, to be about 30 miles southward of *Namyit*.

Loaita Island and Dangers.—*Loaita* (South island of Horsburgh) N. $\frac{3}{4}$ E., 18 miles from *Itu Abaer*, the N.W. extreme being in lat. $10^{\circ} 40' 9''$ N., long. $114^{\circ} 24' 9''$ E.; is a low bushy sand island, and very small, being $1\frac{1}{2}$ cables across, surrounded by a reef, in some places half a mile off.

A reef, of $1\frac{1}{2}$ miles extent, dries at low water, with a small sand cay near the centre, 5 miles N.W. of *Loaita*. Another much larger is three-quarters of a mile to the S.W. of it, extending in that direction nearly $2\frac{1}{2}$ miles; the limits of this danger were ill determined, but the position of the outer, or S.W. extreme, is in lat. $10^{\circ} 42' 18''$ N., long. $114^{\circ} 18'$ E., the sand cay bearing N.E. $\frac{3}{4}$ N., $3\frac{1}{2}$ miles, and *Loaita* island E. by S., $6\frac{1}{2}$ miles.

The dangers in the vicinity of *Loaita* island are not known, but the usual coral bank, with lagoon and surrounding shoal patches was found, and N. by W., 4 miles from it, 7 to 9 fathoms were found on a coral patch at the edge of the bank, and 31 to 34 fathoms had between this and the island.

Dangerous shoals are known to extend 10 or 11 miles to the eastward of Loaita, one of which has a sand cay.

Soubi Reef, the S.W. end of which is in lat. $10^{\circ} 53\frac{1}{2}'$ N., long. $114^{\circ} 4'$ E., is about 6 miles N.W. of the Loaita reefs, and 8 miles S.W. of Thitu reefs, being the westernmost danger hereabout; it is a sinuous coral reef, $3\frac{1}{2}$ miles long. N.E. and S.W., and 2 miles broad, dry at low water, with a lagoon, but apparently no passage into it.

Thitu Reefs and Island—(the N.W. dangers of Horsburg) consist of several patches on two coral banks, separated by a narrow deep gut. Thitu is a low round sand island, not half a mile across, near the middle of the dangers, on the southern part of the reef, which dries at low water, reaching three-quarters of a mile eastward of the island; it forms in that direction the extreme of the western bank. Near its S.W. end is a dark clump tree in lat. $11^{\circ} 3' 9''$ N., long. $114^{\circ} 16' 25''$ E.; in addition to which the island shows some low bushes and two stunted cocoa-nut trees, near which is a small well and a few plantain trees.

The western bank widens out N.W. and S.W. from the island $2\frac{1}{2}$ miles. The N. side of this part of the bank is marked by a round coral reef, three-quarters of a mile across, between which and the reef surrounding the island are $2\frac{1}{2}$ to 7 fathoms, the deep water being next the island. The S. edge of the bank is marked by a reef much smaller than the foregoing, and the depths between it and the island are more favourable for anchoring than on the opposite side of the bank, being nowhere less than $4\frac{1}{2}$ fathoms. From these two reefs the bank narrows, and terminates in a point in lat. $11^{\circ} 2' 30''$ N., long. $114^{\circ} 10' 30''$ E., the island E. $\frac{2}{3}$ N., 6 miles.

The north edge of the bank has a sand cay bearing from the island W. $\frac{1}{2}$ N., nearly $3\frac{1}{2}$ miles, on a large patch of reef, dry at low water, between it and the W. edge of the bank are reefs, shown by breakers. There is a passage of 5 to 12 fathoms into the lagoon between the sand cay reef and $2\frac{1}{2}$ miles N.W. of the island.

The S. side of the bank is not so dangerous as the N. Vessels may anchor on it, the sand cay bearing between N.E. by N. and N.W. by N., or to the eastward of the patch S.W. $2\frac{1}{2}$ miles from the island, with the cay bearing N.W. by W. $\frac{1}{2}$ W. and the island N.E. $\frac{1}{2}$ E. The lagoon has 17 to 19 fathoms depth. The eastern bank is a mass of reefs, its W. extreme is above a mile E. of Thitu island, extending $1\frac{1}{2}$ miles E. and $3\frac{1}{2}$ miles N.E., its average breadth being 2 miles.

The Trident Shoal, E. by N. 16 miles from North Danger, is a coral bank $7\frac{1}{2}$ miles long and 6 broad, shaped like a shoulder of mutton, the broad part being to the northward; it is composed of many patches under 10 fathoms, two of which are dangerous. These patches are on the edges of the bank, forming a lagoon with depths of 26 to 37 fathoms; close outside the bank 100 fathoms finds no bottom.

The worst of these patches is at the northern extreme of the shoal, and is $1\frac{1}{2}$ miles E. and W., and half a mile N. and S.; near its centre in lat. $11^{\circ} 31' 5''$ N., long. $114^{\circ} 30' 3''$ E., is a small spot which is dry at low water springs; the depths on other parts of it vary from $1\frac{1}{2}$ to 6 fathoms: the other, at the eastern extreme of the shoal bears S.E. $\frac{1}{4}$ S., $3\frac{1}{2}$ miles from the former; it is a small spot of $2\frac{1}{2}$ fathom, with depths of 3 to 5 fathoms at half a mile around it; some casts of 4 fathoms were had about a mile W. by S. from the dry part, but no less than 5 fathoms was found on any of the other patches.

A Breman vessel the *G. E. Lorenz Meyer*, Captain Moller, reported having struck at night on a shoal said to be in lat. $11^{\circ} 15' N.$, long $114^{\circ} 51' E.$ This site on being examined no danger was discovered, and it is concluded the *Meyer* touched the eastern patch of the Trident shoal.

Lys Shoal is 2 miles to the southward of the Trident shoal, and like the latter is formed of patches under 10 fathoms, with a central lagoon; only one small spot of 17 feet was found, the S.W. extreme of the bank, in lat. $11^{\circ} 19.7' N.$, long. $114^{\circ} 34.4' E.$; and surrounded with 5 fathoms. We found some 5 fathom patches near the N.E. end of the bank, but nothing under 6 fathoms was met with elsewhere, the general depths on patches being 7 to 10 fathoms, and a short distance outside of them no bottom was found at 100 fathoms.

CAUTION.—Vessels must not attempt the reefs in this part of the China Sea, a long line of shoals is known to exist to the eastward of all these dangers.

Macclesfield Bank.—The *Rifleman* on her way from Hong Kong to the North Danger, crossed this bank in March, 1865, and again in April of the present year. On the first occasion, soundings were struck in lat. $16^{\circ} 11' N.$, long. $114^{\circ} 26' E.$, in 115 fathoms, sand and mud; from hence on a S. by E. course over the bank the least depth of water found was 12 fathoms, the general depths being 40 to 50 fathoms; but a patch of 15 fathoms was found near its southern edge in lat $15^{\circ} 34' N.$, long. $114^{\circ} 30' E.$; and 5 miles further southward no bottom with 307 fathoms.

On the second occasion of crossing the bank from lat. $16^{\circ} 34' N.$, long. $114^{\circ} 13' E.$, a course was steered for the 4-fathoms patch, reported by Captain Moses, of the Siamese vessel *Bangkok*, in lat. $16^{\circ} 2.5' N.$, long. $114^{\circ} 2.5' E.$; the deep sea lead constantly going found no bottom with 50 to 60 fathoms of line. At noon the ship was in lat. $15^{\circ} 59' N.$, long. $113^{\circ} 58' E.$, and she had passed about 2 miles to the westward of his position of the patch. Proceeding southward, 42 fathoms, coral bottom were found on the northern edge of the bank in lat. $15^{\circ} 51' N.$, long $113^{\circ} 57' E.$; these regular depths of 42 and 43 fathoms to lat. $15^{\circ} 30' N.$, long. $113^{\circ} 57' E.$, where 32 fathoms were had; 3 miles S. of this position there was no bottom with 100 fathoms.

Coral Bank.—Proceeding from Loaita island, round the northern edge of the Archipelago, 47 fathoms were found on a coral bank it lat. $11^{\circ} 28' N.$, long. $116^{\circ} 46' E.$; continuing E. by S. $\frac{1}{4}$ S.; 3 miles farther 44 fathoms were had, and soon after 12 fathoms on a small coral patch in lat. $11^{\circ} 26' N.$, long. $116^{\circ} 53' E.$ Continuing the same course, the depths were 42 fathoms for 5 miles; at 8 miles 125 fathoms, and at 14 miles 175 fathoms; a few miles farther, no bottom was found with 200 fathoms.

Routh Shoal is at the N.E. angle, as Nilo reef is at the N.W. angle of the Archipelago of reefs, and forms the N.E. limit of the Palawan passage. It is a pear shaped coral bank, 8 miles in length N.E. by E., and S.W. by W.; $4\frac{1}{2}$ miles broad at its N. end and 3 miles at its S. end; it is not dangerous, the least water on it being $4\frac{1}{2}$ fathoms. A 5 fathoms patch, about three-quarters of a mile in extent is at the north extreme of the bank in lat. $10^{\circ} 50' N.$, long. $117^{\circ} 46' E.$ Nothing less than 6 fathoms was found on the other patches surrounding the lagoon; the depths in the lagoon vary from 17 or 19 fathoms at the borders to 35 fathoms in the centre.

The northern part of this shoal was crossed by the *Seahorse* many years ago, and the southern by Captain Routh, of the *Bombay*, in 1835.

Holmes Shoal.—From the Routh shoal, on a S.E. $\frac{3}{4}$ S. course no bottom was found within 200 fathoms on the supposed position of the Holmes, nor was there any sign of shoal water visible 7 miles further to the S.; from this last position the ship was steered N. 8 miles, and then S.S.W. $\frac{1}{2}$ W. 23 miles, with the same result, again crossing over, or near to the position of the shoal. Captain Curling of the P. and O. Co.'s service, passed over the same place in 1862, without seeing anything like shoal water, and many Commanders of steamers have reported to the same effect.

This danger should therefore be removed from the chart; there is no such shoal where reported, and there are reasons for believing that the *Fairie Queen* shoal, 18 miles to the westward, is the real Holmes shoal.

Luconia Shoals.—Most of them were surveyed in the *Rifleman*, and published in 1863, but the account was not, and is not completed to the northward and westward, by the following:—

The northernmost of the shoal patches reached in 1863 was in lat. $5^{\circ} 48' 5''$ N., long. $112^{\circ} 32' 3''$ E.: when the ship was anchored near a $2\frac{1}{2}$ fathoms patch, in lat. $5^{\circ} 33' 3''$ N., long. $112^{\circ} 31' 5''$ E., on the northern edge of a coral bank, traced 2 miles to the southward, but which no doubt extends to the northernmost patch surveyed in 1863, and just referred to; vessels should not pass between these positions.

Friendship Shoal is the northernmost of the Luconia group; the *Rifleman* crossed it with $4\frac{1}{2}$ fathoms least water, although less depths were suspected. The N. part of the shoal is in $5^{\circ} 59' 5''$ N., long. $112^{\circ} 31' 52''$ E., approximately. Lines of soundings were taken in a N.E., N., and N.W. direction, from the N. end of the shoal for 4 miles, but no shoal water found.

GENERAL REMARKS.—Hainan fishermen, who subsist by collecting trepang and tortoise-shell, were found upon most of these islands in April and May, some of whom remain for years amongst the reefs. Junks from Hainan annually visit the islands and reefs of the China Sea with supplies of rice and other necessaries, for which the fishermen give trepang and other articles in exchange, and remit their profits home; the junks leave Hainan in December or January, and return with the first of the S.W. monsoon. The fishermen on Itu Abaer were more comfortably established than the others, and the water found in the well on that island was better than elsewhere.

PARACEL ISLANDS.—These islands were visited in February, 1865, by H.M.S. *Rifleman* for the purpose of relieving the crew of a wrecked vessel, and the following information was obtained by Mr. Tizard, Master R.N.

Lincoln Island.—South-east point in lat. $16^{\circ} 39' 6''$ N., long. $112^{\circ} 44' 4''$ E., $1\frac{1}{2}$ miles long, N.W. and S.E., $\frac{3}{4}$ of a mile wide, is about 20 feet high; covered with brushwood, and surrounded by a coral reef, dry at low water, extending $1\frac{1}{2}$ miles from its S.E. point, $\frac{1}{4}$ a mile from its N. and E. sides, and about a cable's length from its S.W. side. A narrow coral shoal extends southward from the S.E. point of the island, said by Horsburgh to extend 11 miles; judging from the soundings that were obtained, the dangerous part of this shoal does not appear to extend further than 3 miles from the island. Good anchorage can be obtained in

N.E. monsoon under its lee in 8 to 10 fathoms, coral, about half-a-mile from the shore.

The spring of excellent water, mentioned by Horsburgh, is merely a well dug by the Hainan fishermen close to a stunted cocoanut tree, into which the salt water filters.

Pyramid Rock from the S.E. point of Lincoln island, bears S.W. $\frac{1}{2}$ W., distant $7\frac{1}{2}$ miles. The coral bank round Lincoln island probably extends to the Pyramid rock.

Amphitrite Islands.—These two groups appear to be on the edge of an extensive coral bank, as a reef $1\frac{1}{2}$ miles wide of 6 to 9 fathoms, it extends $3\frac{1}{2}$ miles to the south-eastward of Woody island, the extremity of which could not be seen from the *Rifleman* when crossing it.

The spring of clear water, asserted by Horsburgh to exist on Woody Island, is merely a small well dug by the fishermen, like that on Lincoln Island.

Duncan and Drummond Islands.—Duncan (two) Islands are joined by a sandy spit always uncovered. They extend a mile E. and W., are four cables in breadth and surrounded by a coral reef in some places four cables from the shore, dry at low water. On the westernmost of the islands is a cocoanut tree.

Drummond Island is nearly round, and about three cables across; two cables south of it is a rock always dry. A coral reef commences the W. side of the island, and continues some miles to the E. and N.E. of it. Both Duncan and Drummond Islands are covered with brushwood. Between them is a safe channel, upwards of a mile wide, with 19 to 20 fathoms water; Horsburgh says it should not be taken by large vessels, the passage W. of Duncan Island being better, but the *Rifleman* when passing between Duncan and Money islands, suddenly found shoal water, which appeared to continue across that channel, and therefore the channel between Duncan and Drummond islands is certainly safer for steamers. Vessels may anchor to the northward of Duncan Island in 16 to 18 fathoms, about half-a-mile off shore.

21st September, 1867.

PHILIPPINE ISLANDS.—Account of dangers in the navigation of the Philippine Archipelago.

[All bearings are Magnetic. Variation $0^{\circ} 30'$ Easterly in 1867.]

The Perseus Rocks, off the coast of Sibuyan island, discovered in April 1867, by H.M.S. *Perseus*, Commander Charles E. Stevens, striking on them! are of coral, and supposed to be connected by shoal ground, being only distant $5\frac{1}{2}$ miles apart in a N.E. by N. and S.W. by S. direction; the southern rock is $7\frac{1}{2}$ miles E. from Cavit point, and the northern rock E. by S. $\frac{1}{4}$ S. nearly eight miles from Cambalayan point. Captain Fagg, of the Spanish Merchant Steamer *Sud Este*, in describing dangers of this Archipelago, "There is another reef to the southward of the island of Sibuyan, bearing from the Cresta del Gallo N.E. 4 to 5 miles. I have several times crossed it, being in my track from Romblon to Zebu. The least water I found on it was $5\frac{1}{2}$ fathoms." This reef is probably a part of that on which the *Purseus* struck, and also that alluded to in Horsburg's Directory as having been seen about 10 miles E. of Sibuyan island.

Fagg Reef.—Captain Fagg also reports, that being under full steam off San Fernando point, West coast of Luyon, he clearly saw the bottom; he immediately stopped the engines, and took the following bearings, S. point of the isthmus of San Fernando S. 50° E., and the church of San Juan to the northward E. 10° N., approximately; he sounded first in five fathoms, then continuing to the southward had 5, 6, 7, 8, and 9 fathoms, and passing out to 50 fathoms.

This would place the reef $3\frac{1}{2}$ miles N.N.W. $\frac{3}{4}$ W. from the W. extreme of St. Fernando point and in lat. 16° 39' N., long. 120° 14' E. of Greenwich approximately.

Nalupa Reef.—Also while proceeding southward from the village of Tibiao on the W. coast of Panay island, he had soundings on a coral reef, well known to the small coasters, off the village of Nalupa; some parts of it appeared awash, but Captain Fagg had $1\frac{1}{2}$ fathoms with the village of Nalupa bearing E. by S., distant about two to two-and-a-half miles.

Batbatan Island.—A reef of rocks extends to the N. and N.E. of this island, that are not yet on the charts.

24th October, 1867.

TIME BALL AT CRONSTADT.

The following Notice was intended for our last number, but receiving it later than others, they had the preference, and we now give it place. But it is late in the year for the Navigation of the Gulf of Finland, and our seamen will not fail to avail themselves of its advantages in the ensuing summer. The Notice stands thus:—

Five minutes before the moment of the *Cronstadt mean noon*, a ball is hoisted daily at the masthead of the Naval Telegraph; the instantaneous fall of this ball indicates the moment of the *Cronstadt mean noon*.

The indication of this time is shown daily during the year.

During the navigation, in addition to this, the moment of *Greenwich mean noon* is indicated daily, *Sundays excepted*. In this case, the Time Ball is hoisted five minutes before the Greenwich noon half-mast-high, half a minute before noon to the masthead, and at the moment of *Greenwich mean noon* is dropped instantaneously.

The Longitude of Cronstadt is 1h. 59m. 3s., 3 E. from Greenwich,
and 7h. 7m. 14s., 5 E. from Washington.

So that at the moment of the *Cronstadt mean noon*
at Greenwich is reckoned 10h. 0m. 56s., 7 A.M.,
,, Washington ,, 4h. 52m. 45s., 5 A.M.,
and at the moment of the *Greenwich mean noon*
at Cronstadt is reckoned 1h. 59m. 3s., 3 P.M.,
,, Washington ,, 6h. 51m. 48s., 8 A.M.

Cronstadt, 1867, July 31st.

Astronomer Hubner.

A PACIFIC SUBMARINE TELEGRAPH.

IN our last number we noticed the project of an electric cable being laid to connect Yokoham with Jeddo,* and we have now met with another, which is to be laid in the bed of the wide Pacific Ocean. Progress is the order of the day, but it appears, and we say it from no motive of compliment that our American friends do more to break through old fashioned routine and not only encourage progress but find new ways of doing it by departing from the beaten track, than their progenitors in this part of the world. They have established a most important line of steamers between San Francisco and Hong Kong in the north, while we have ours between Panama and New Zealand in the south.

It appears that the Panama, New Zealand, and Australian Royal Mail Company's steamer *Matala* arrived at Panama on the 4th instant, in advance of her time, and not a day and a half late, as stated in the telegrams in to-day's papers, the through voyage from Sydney having been performed in two days less than the contract period.

An illustration of the way in which two steam companies may by co-operation mutually benefit each other is afforded in the report just issued by the directors of the Royal Mail Steam Company, which states that "the line of steam communication with this company's line, the Panama route to New Zealand and Australia, having now been in operation over twelve months, it affords the directors of this company much satisfaction to draw attention to the highly successful manner in which the service, embracing the long ocean voyage from Panama to New Zealand, and *vice versa*, has been, from the commencement, performed by the vessels of that company." This tribute to the efficiency of the young Australian company is well deserved, and

* Speaking of Japan, we regret to find that our seamen have not found yet that the lower class of Japanese are not to be trusted. The Lonins or professional murderers stop at nothing, as they have shewn by numerous instances besides the following:—A correspondent in Japan forwards us the following concerning two unfortunate seamen of the Royal Navy who were found murdered in the streets of Nagasaki, each by a single sword cut:—"On the night of the 5-6th of August two seamen of Her Majesty's ship *Icarus*, on leave from their ship, lying in the harbour, were found dead in the streets of Nagasaki. The corpses lay in the gutter outside a house of refreshment. They had been last seen alive at ten p.m. by some of their shipmates, when they were sober, and their corpses were discovered at two a.m. by the Japanese police. The murder would appear to have been effected in a systematic manner on perfectly unresisting victims, who were most probably sleeping in a recumbent or semi-recumbent position, as the wound in each case was single and in both cases similar. It was a clean incision, like a sword-cut, across the front of the neck and chest, passing obliquely downwards from right to left, and almost severing the head from the trunk, so that death must have been instantaneous; and, in fact, the bodies and hands bore no signs of struggling, and were free from minor cuts and contusions. There are only four sword cuts in modern English drill:—1, diagonal, from right to left of swordsmen; 2, diagonal, from left to right; 3, horizontal, from right to left; 4, horizontal, from left to right. The fatal cut was No. 2 in both cases."—*British Medical Journal*.

it is satisfactory to believe that the friendly co-operation of the two companies will continue to redound to the advantage of both.

We believe their's to be far larger and more powerful vessels than ours, still we are glad to find that our last arrival at Panama on that line was two days less than the stipulated time. It is at least satisfactory to know that we are contributing toward this progress by our line, and that for many years we have been leading the way in scientific geographical expeditions to the different and extensive shores of that vast sea. Still how much remains to be done is too well known to those whose business it is to navigate its waters, and it will be yet very long before we shall be able to shew the seaman a good intelligent chart, by which he can approach any of its shores without fear of sunken dangers. Still we have done our share in the great work, and we are glad to find that our American brethren are following us up in good spirit and determination. There is an abundance yet left for all of us to do.

We find the following in a paper of the Sandwich Islands, that will interest our nautical readers :—

In this wonderful nineteenth century—this age of steam, iron and lightning—it has become the fashion not to be astonished at anything, and never to express doubts of the fulfilment of prophecies, the utterance of which fifty years ago would have rendered a man, in public opinion, a fitting candidate for a lunatic asylum. It is less than fifty years ago that a learned American savant, in a laboured article, proved most conclusively to his own satisfaction and that of many others, that it was quite impossible for steamers to cross the Atlantic.* The project of a railway, with steam cars, when first laid before the British Parliament, was received with jeers of incredulity. Morse † was years besieging the doors of Congress before his supposed Utopian scheme of an electric telegraph received sufficient consideration to allow of a line being constructed between Baltimore and Washington. Nobody at first believed that Ericsson's Monitors ‡ would ever live in a sea-way, or could be made habitable for human beings. Thus, one after another, old preconceived notions as to what is possible for the creature man to accomplish and what is impossible, are dispelled, and we tacitly wait the announcement of some new wonder, fully prepared not to be surprised.

For instance, if we should prophecy that in a few years hence Honolulu would be in telegraphic communication with San Francisco, and consequently with all the rest of the civilized world, the probabilities are that plenty of people could be found who would laugh at the idea as utterly visionary.§ Seriously, however, it is quite

* Of course the writer alludes to Dr. Lardner, who wrong as he was, has yet interested the world by his scientific works.

† Professor Morse was not more successful in London.

‡ Ericsson's or Captain Cole's which, we should like to know.

§ Yet it is not so difficult as the project of a bridge across the English channel !

within the range of possibilities that, during the next ten years, the cost of making and laying a submarine telegraph cable will be greatly reduced—so much so as to bring the accomplishment of the enterprise within the reach of even our modest means. And whenever that time arrives, as it surely will—sooner or later—we are fortunate in having already a survey of the route between these islands and San Francisco, with soundings, and a reliable description of the nature of the bottom of the ocean.

On the 9th of November, 1858, the United States surveying schooner *Fennimore Cooper*, Lieut. J. M. Brooke commanding (a former pilot boat of ninety-five tons burthen), arrived at Honolulu, after a passage of forty-three days from San Francisco. Lieut. Brooke was the inventor of a sounding apparatus, which was the one used in surveying the bed of the Atlantic, preparatory to laying the cable which now connects the old world with the new. The peculiarity about this apparatus is that a thirty-two pound shot at the end of the line takes it to the bottom, immediately on striking which it is disengaged by a spring and falls off, while a glass tube immediately above the shot becomes filled with the soft sedimentary deposit of the ocean bottom. Lieut. Brooke has specimens of all the products of his soundings in the Pacific, mostly consisting of dead mollusca and infusoria.

About three hundred miles west of the Golden Gate he found a submarine range of mountains, running parallel with the Sierra Nevada range, the depth of water on which was about two miles on an average, while the lowest depth reached did not exceed three miles. The project of an ocean telegraph, between Europe and America, had then been talked of, and Lieut. Brooke had sounded the route. He said, while here in 1858, that there would be vastly less difficulty in laying down a cable between these islands and the California Coast than between Ireland and Newfoundland.*

The *Fennimore Cooper* being on special government service, as a matter of course her commander was not at liberty to make known to the public the results of his observations in full, but transmitted them to the head of his department, whence they can doubtless be obtained on application. The hydrographic officer of the schooner was Lieut. Kern, an adventurous as well a scientific man. He was the discoverer of the celebrated Kern river, the finding of gold in the neighbourhood of which created such a furore and stampede among the miners of California some years ago.

Between the Farralones and within fifty miles of these islands, Lieut. Brooke made sixteen soundings, the result of three only of which have transpired, so far as we have been able to ascertain. These are as follows :

Latitude 31° N., Long. 130° W., 2400 fathoms.

Latitude 25° N., Long. 132° W., 2600 fathoms.

Latitude 21° N., Long. 144° 25° W., 2500 fathoms.

* We all know well how ably and successfully this was done after the experience and failure of the two former. See our Vol. for 1865 and 1866.

With the exception of the ridge before mentioned, there are no elevations or depressions in the bed of the Pacific, but the bottom appears to be a vast level plain, to within fifty miles of these islands, when the depth begins rapidly to decrease. To reach bottom at the depth of three miles, required one and a half hours, and it took two men four hours to reel up the line after the bottom had been reached. With such scientific men as Lieuts. Brooke and Kern, possessed of all the appliances of nautical science, the utmost exactitude must have been obtained in their observations. The schooner was provided with no less than seventeen chronometers, and to secure a perfect immunity from the least jar, these were placed in gutta percha cases.

Our readers will remember the Japanese boy, Joseph Heco, and his history. He came to Honolulu on the *Fennimore Cooper*, and remained here for a time, returning to his own country by another vessel. He is now residing at Yokohama.

As we said above, the full report of the cruise of the *Fennimore Cooper*, is without doubt on file in the Navy Department at Washington, and at the present time its publication would be particularly appropriate. The application would very properly come from the California delegation in Congress, and would unquestionably meet with prompt attention.

The great and growing State of California needs and will eventually have direct telegraphic communication with China and Japan, and we look forward confidently to the time when these islands shall become the connecting link of the magic wire between the ancient and opulent "Ind" and the young and vigorous West. The tide of human progress sets in this direction, and we must swim with the current or run the risk of losing our frail bark in the rapids.

The schooner remained about these islands until February, 1859, having meantime visited French Frigate Shoals, of which a thorough survey was made.* From here she went to Japan, and Lieut. Brooke no doubt carried out his expressed intention of obtaining deep-sea soundings all along his route to Japan. While at Hakodadi a tremendous earthquake occurred, and the *Fennimore Cooper*, as well as the Russian frigate *Diana*, which had formerly visited these islands, were both carried on shore by the in-rushing sea, and broken up so much that they were abandoned.

The subsequent history of Lieut. Brooke and his companions we have never learned, beyond the fact that from Japan they reached China and from thence the United States. But the fact remains on record that the Pacific Ocean, to the extent of 2,100 miles, between San Francisco and the Hawaiian Islands, has been thoroughly sounded, and the feasibility of laying down a submarine cable clearly demonstrated. And so we bide our time.

In reference to the island in the Pacific, half way between California and China, we suspect our Sandwich Island friends will be disappointed. A New York paper tells us of an island in the Pacific taken possession

* We are glad to learn that this addition has been made to Pacific Hydrography.

of for the United States.—San Francisco, Sept, 17.—The schooner *Milton Badger* has returned from Brook's Island. She left at anchor off the island the United States ship *Luckawanna*, on an exploring expedition. The *Badger* anchored three-quarters of a mile from the shore, discharged her cargo safely, and left on the island Captain Burdett and eight men. The island is situated in latitude $28^{\circ} 13'$ north, longitude $177^{\circ} 0'$ west. The steamers of the China line can anchor four miles off the island, in about eight fathoms of water. The island will be used as a depot for these steamers. The *Badger* took the first instalment of supplies.—*New York Tribune*, Sept. 23.

We would not be supposed to assert that the foregoing may turn out to be the true position of the island, but as we read of an island, which among other names has that of Massachussets and is said to be an old American discovery, it is so near that of the above, that we think that it is more likely to be adopted by the American line of steamers than the out of the way Honolulu of the Sandwich Islands. But we shall no doubt know more of this hereafter, as well as the rest of the great progress our good friends are making in this great Pacific Ocean.

THE MAIL STEAMER *Atrato*.

No one need wonder, after reading the following, that the *Atrato* has proved an unhealthy ship :—

A correspondent of the *Times*, who was one of the unfortunate passengers by the Royal Mail steamer *Atrato* from St. Thomas, who had to undergo ten days' quarantine the other day in the *Parana*, on the Motherbank, gives the following account of his adventures on board :—

On our arrival at St. Thomas by the Royal Mail steamer *Tyne*, from Colon, we were moored alongside the *Atrato*, and on the following day were transferred to that ship. In the course of the day it came out that the chief officer of the ship was then dying on board of yellow fever, that the mail agent had been given over by the doctors, and that fourteen of the crew had been sent to hospital, suffering from the same horrid disease ; of these it was understood that five died before we left St. Thomas.

Imagine, sir, our feelings on learning that one hundred and fifty passengers, suffering from no contagious illness, had been put on board a ship reeking with the contagion of yellow fever in its most malignant form, and that when there was at least one other ship in port, free from disease, that might have been substituted for the *Atrato*. On boarding the *Atrato* we were much surprised at the small size of her cabins and the absence of ventilation in many of them, which, being placed on the third deck, and close to the water-line, cannot receive fresh air through the ports at sea ; the only other mode of ventilation

for these cabins is by wind sails, which are removed during bad weather or rain, so that the unfortunate lower-deck passengers are frequently left for many hours without a breath of fresh air reaching them.

In harbour at St. Thomas the air is so offensive that one is forced to close the port and rather have no fresh air at all than breathe an atmosphere so villainous. The cause of this is that the harbour is tideless, and the water consequently nearly quite stagnant, so that dead animals and garbage of all kinds thrown overboard from the ships frequently float around them for hours, and under the rays of such a sun emit a stench more easily to be imagined than described. Can any one wonder that the crews of ships, sweltering for weeks in such a spot, should suffer frightfully from yellow fever, or that the inhabitants die in great numbers of cholera and small-pox, often combined? But my most serious charge against the Royal Mail Company is the want of proper attention to cleanliness and sanitary regulations that prevails in those of their ships in which I have sailed—viz., the *Tyne* and the *Atrato*. The ventilation of the former ship, though she never quits the Tropics, is hardly better than that of the *Atrato*, while the black stewards give themselves no trouble to keep the cabins clean and sweet nor were we much better off in that respect when we reached the *Atrato*.

In the first place, no baths could be had while the ship lay in port, and even at sea, when the tanks were supplied with water, the bath accommodation was very insufficient even for our small number of passengers. The captain and officers were generally willing to do all in their power for our comfort, and the stewards were tolerably attentive, but so reduced were they in number from death and sickness, and so feeble were many of them from the effects of the climate, that they were incapable of performing their duties satisfactorily. Still, the after part of the ship was kept tolerably clean, but forward I am sorry to say, a very different state of things prevailed. The second-class passengers' complaints of the dirty state of their end of the ship were loud and frequent. Had bad weather set in while we were in the Tropics, forcing us to close the upper ports as well as the lower, and the skylights, the results might have been most lamentable. Even with fine weather and a complement of less than one-half of the passengers the ship is allowed by certificate from the Board of Trade to carry, we lost seven men by yellow fever on the passage, and three others died after our arrival at Plymouth.

There were besides many cases where the disease took a milder form, and the patients recovered. The number of sick was sometimes reported as high as forty. The only thing in the company's ships deserving of commendation is the *cuisine*. Our food was good in quality, well cooked, and superabundant, so that I, who had a cabin on the lower deck, often exclaimed, "Oh! for half the food and double the air. And now a few words on our treatment by Government on our arrival, which was, in our opinion, very bad. We were transferred in open boat on a stormy damp evening, sick and well, men, women,

and children, to an old hulk, the *Parana*, where everything, including bedding, was so saturated with moisture that many could not use it, and many of those who did were laid up with severe colds. Several relapses of old complaints brought on by service in hot climates occurred, and the health of nearly all on board suffered from our long detention in the *Parana*. Better medical care would be a great boon to future sufferers by quarantine; if it is to be a regular institution of this country, as seems likely, the sooner our Government follows the example of others and provides suitable accommodation on shore, and proper medical attendance, the better for its own credit and reputation for humanity.

But after reading the above who would embark on the *Atrato*?

AERIAL NAVIGATION.

OUR friends of the Aeronautical Society will glory in the following morceau from San Francisco—of Californian celebrity. For our own part, we have some unhappy reminiscences of the *Eagle* of Kensington notoriety, so that had we ever an idea that man was designed by his Creator to become an aerial locomotive, we lost all faith in such an opinion long ago.

THE AVITOR.—This is the name of the new air ship, now nearly completed in San Francisco. A well known and practical mechanic of that city has given a favourable report of the *Avitor* to the office of the Aerial Steam Navigation Company, and from it we glean the following. He says:

As regards the probable velocity of the *Avitor*, I would say nothing. Once afloat, and I can see nothing to hinder its floating; it is merely a question of resistance. For an invention so novel, the *Avitor* has met with comparatively few practicable obstacles; and when it is remembered that the difficulties in the way of Fulton's experiment were much greater than those that have kept back the *Avitor*, and that the principle is in both cases equally sound, it will be seen that there are good reasons for the belief that the machine, with the modifications referred to, will yet successfully navigate the air. The experiments with petroleum as a steam generator, which no doubt will be successful, will furnish a compact and light fuel for generating steam. After the *Avitor* has been floated, there may be some changes of the propelling machinery suggested, but, ultimately, it must be a success.

In addition to the above, we give the opinion of Peter Donahue, Esq.

I have followed with great interest, and have personally observed the construction of the *Avitor*. I am so thoroughly convinced of the practicability of the enterprise, and so entirely concur in the foregoing observations respecting the two modifications to be adopted, that I have no hesitation in saying that when these changes are made, the *Avitor* will answer all the purposes of the inventor, and fully realize

the expectations of the public. As soon as the elevating power shall, in this way, have been perfected, the work will be completed, because the propelling force is ample, the machinery for elevating and depressing sufficient, the steering apparatus in fine working order, and, in short, the whole of the *Avitor* is fully under the control of the operator.

THE ETHNOLOGY OF ABYSSINIA.

THE ordinary monthly meeting of the London Ethnological Society was held last evening at the rooms of the society, St. Martin's-place; Mr. J. Crawford, president of the society, occupied the chair; and among those present were Sir H. Rawlinson, Dr. Beke, Sir Alexander Waugh, Mr. Wyld, M.P., Captain Sherrard Osborn, Dr. Lockhardt, Lady Franklin, Dr. Hyde Clark, Dr. King, and Messrs. Dickenson, Franks, R. J. Slack. and J. G. Major. After the usual routine business had been transacted,

Mr. Major, the secretary of the Geographical Society, read a paper prepared by Mr. J. Crawford, upon "The Ethnology of Abyssinia and the adjacent countries," founded upon the report of the late Mr. Plowden, consul in Abyssinia, made in 1854. In this report Mr. Plowden described the country as most productive, and the climate of the highlands of Abyssinia as very salubrious. The valleys, however, he stated, were at certain seasons rendered dangerous by fevers. The country combined mineral resources and tropical luxuriance with so much general salubrity as to prevent the risk of any great waste of European life. Little, however, had been done for the country by energy or skill, and the utter want of roads and bridges, the stagnant or lawless nature of the social customs, the obstinate attachment to ancient usages and manners, the multitude of rulers, indifferent to anything but their own enjoyment, the constant wars and consequent insecurity of life and property, were fast ruining it. The members of each tribe had different peculiarities, but the general characteristics of the whole people were thus described by Mr. Plowden—"In some respects they are a happy people. They possess in their own land all the necessaries and many of the luxuries of life in profusion; they have great freedom of speech and action, and are always gay, systematically, as by constitution. Their conversation, often sensible, is always witty. A practical philosophy leads then to prefer laughter to tears; the tragedy and comedy of life are received alike with indifference or a joke. Misfortunes and death are generally met with fortitude. It is hard to convince them that they will benefit either by our science or our wealth. The most curious point in their character is this, that no one is expected to feel ashamed of any crime or vice; and whereas in other countries men in committing serious crimes are morbidly excited, in Abyssinia they are perpetrated with indifference,

and generally recounted, sometimes by the individual himself, certainly by others, with gaiety and laughter. In the same way, females are rarely gross or immodest outwardly, seeing that they need in no way be ashamed of the freest intercourse with the other sex. I have never yet been able to discover what an Abyssinian could be ashamed of, except a solecism in what he considers good manners, or the neglect of some superstitious form of social observance. They are peculiarly sensitive, however, to ridicule and abuse, whether true or untrue, and half the time of an Abyssinian master is passed in deciding disputes on such subjects. Some traits, though apparently of slight consequence, are often very irksome to a stranger; for instance, every man above the lowest rank as a door-keeper, whose duty it is to examine who should be admitted and when. The insolence of this officer rises in proportion to the rank of his master. The primitive ante-chamber is a court in the open air, without seats, often muddy, always filthy; and as the porter will contrive to keep you waiting, even against his master's orders, this system is most disagreeable to a European. Further, you wait amongst a crowd, and it is pointed out to you that the brothers or sons of the King are there in the same position. Sometimes the order comes to clear the court, when sticks are used without distinction of persons." Further he said:—"They have in general an aversion to change in their religious observances, laws, and customs; their ancient laws are, however, nearly forgotten, and their manners are changing yearly.

"This, which is characteristic of the race, is a great obstacle to improvement. Neither the idea of progress nor the word exists; for all absurdities and abuses, even for injustice, the reason 'it has always been so' is held sufficient even when the error is admitted. In consequence, as nothing can be stationary, their whole institutions are degenerating. They are very quick of apprehension and subtle of speech, and as from childhood they are accustomed to select phrases that may be agreeable to the person they are addressing or useful to themselves, are always specious and sometimes eloquent. It is very difficult for a stranger to arrive at the truth by questions. They are fond of litigation, and most of them skilled in the quibbles and proverbs that are essential to success in any dispute. It is the favourite sport of boys and children, and the smallest difference of opinion furnishes matter for a long and sometimes expensive lawsuit. Their obstinacy in trifles is a mark perhaps of their Jewish blood. Notwithstanding the abundance of food in Abyssinia, nothing is more difficult or occupies more time than to provide for the daily wants of an establishment. A chief can obtain anything at once, and often without payment, where a stranger infinitely richer would, without his friendship and assistance, run the risk of starving.

Nothing can be obtained by money except at a market, and often at a very great distance. Shops are unknown, and almost all trades must be practised in each household. Water must be carried for household purposes from a distant brook, corn must be converted into flour, cookery must be prepared, bread baked, and beer brewed in every es-

tablishment according to its numbers, and to no office of domestic utility will a man put his hand for any amount of hire. On a journey where no markets can be found all necessaries must be carried at least to the next large town, involving a very inconvenient amount of baggage." * * "Individually they are brave, but in masses, being without discipline, are hesitating, and little to be feared. Having no coinage of their own, the only money that passes current in Abyssinia is the German crown Maria Theresa. This is changed in Teegre, into pieces of cloth of various lengths, fabricated from cotton of the country or of India; and in the Amhara into blocks of salt, vary in number at each market-place. This salt is cut in the plains of the Taltal, near the Red Sea, and transported far into the interior. It becomes very valuable in the Galla provinces, where eight small pieces are sometimes exchanged for a dollar, and a hundred will purchase a slave. Gold, which under their emperors was used as a currency by weight, and was abundant, according to tradition has now almost disappeared. The ruler of Shoa sent some pounds of fine gold to the court of Gondar, moulded in the shape of a mule, in token of fealty. The custom was continued till the last forty years.

The whole dress of the people is of white cotton cloths, spun and wove in the country, nor do they consider a foreigner as dressed at all unless he throws one of their white mantles over his own apparel. It illustrates curiously the character of this nation, so vain and stubborn in trifles, to see the servants of even a well-dressed European follow him almost with shame, and the rest of the populace regarding him with laughter or sneers; nor is this a small matter nor a trifling difficulty. The first impression does much, and ridicule is harder to vanquish than persecution. Socrates, in our modern attire, would scarcely be respected in Abyssinia. There are no castes in Abyssinia, but the people may be divided into four classes—military, sacerdotal, agricultural, and mercantile; the number that cannot be included in these is insignificant—a few workmen, as tanners, saddlers, and blacksmiths, disproportioned even to the wants of the community, and some idlers who live by the produce of their farms.

The great chiefs have generally much dignity of manner, and some of them might be models of tact and polite suavity, particularly those who have any pride of ancestry: but engrossed with the sensual pleasures afforded by their wealth and power, and uncertain how long they may enjoy them, they never dream of improving the condition of their subjects, though often just and indulgent in their rule, as far as the paramount necessity of conciliating their armies will permit." The character of King Theodore, or as he was then called Dejaz Kasai, was thus drawn by Mr. Plowden:—"Dejaz Kasai is vigorous and subtle, daring to a fault, and, perhaps, more disposed to innovation than any. He has abolished in his army the practice of mutilating dead bodies; taught his soldiers some discipline, makes war without baggage or camp followers, and encourages foreigners. Though proud, his manner is all humility; he is severe, liberal, and usually just, but breaks out now and then into unaccountable acts of violence, which

indicate a somewhat unsettled temperament; he commences enterprises with more vigour than he pursues them, and is much under the influence of prophets and fortune-tellers."

Mr. Crawford, in his paper, made some general comments upon the consular report, and summed up the whole matter by declaring his opinion that "we must come to the conclusion that, although the Abyssinians are very old Christians, they are but very indifferent ones, and that in civilisation and morals they rank below most of the nations professing Mahomedanism, Hinduism, and Buddhism."

The paper was listened to with great attention, and at its conclusion there was some applause. In the course of a short discussion which followed,

Sir H. Rawlinson expressed his confidence in Mr. Plowden, as the best authority upon Abyssinia as it existed in his time, but reminded his hearers that during thirteen years which had elapsed since the date of his report there had been many essential changes in the circumstances of that country. King Theodore had abolished Mahomedanism, had secularised the church property, and had crushed the priestly influence, which in the time of Mr. Plowden was one of the crying evils of Abyssinia. He had also introduced many useful reforms into the administration of justice, and had adopted measures for the encouragement of industry. As long as Plowden and Bell were alive he was to a certain extent a model sovereign, but since their deaths he had gone to the bad.

Dr. Beke said that Mr. Plowden's account of the Abyssinians was, as far as it went, the best that he knew; but it had some faults. Mr. Plowden did not visit the best provinces—the southern provinces—and therefore could not report of them. He knew the Amharas and the Fegrees, but he did not know the Gallas. King Theodore, he said, was from the first an arrant villain. He was made a great man and a good man by Bell and Plowden, but the moment they died he became bad. As long ago as 1852 he was an arrant drunkard, and used to fire under the table at the legs of his guests.

Both Sir H. Rawlinson and Dr. Beke made some observations upon the races and languages of Abyssinia, and after Mr. Crawford had replied upon some points upon which he differed with them, the proceedings closed with the customary vote of thanks.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, in November, 1867.—Sold by J. D. Potter, 31, Poultry, and 11, King Street, Tower Hill, London.

2084. DEM = 0·30 Africa, South Coast, Mossel Bay to St. Francis Cape. Staff-Commanders Skead and Stanton, R.N. 1867. 3s.

1707. DEM = 0·7 Australia, South Coast, Port Western. Commander Cox, R.N. 1867. 2s. 6d.

Sailing Directions for West Coast of Scotland and the Hebrides. Captain Otter, R.N., C.B. 1867. 3s. 6d.

Sailing Directions for South-east Coast of Nova Scotia and Bay of Fundy. Staff-Commander G. F. McDougall, R.N. 1867. 4s.

Tide Tables for 1868. Staff-Commander John Burdwood, R.N. 1s. 6d.

EDWARD DUNSTERVILLE, *Commander, R.N.*

Hydrographic Office, Admiralty, 20th November, 1867.

INDEX TO VOLUME FOR 1867.

ENLARGED SERIES.

- Absconding, Allusion to a Case of, 237
 Abuses in Emigrant Ships, 351
 Abyssinia Hand-book, 570
 Abyssinian Captive's Letter, 629
 Abyssinian Nile Tributaries, 631
 Act, Merchant Shipping, 506
 Adelaide, Queen, Naval Fund, 420, 665
 Adelaide Fund, Note on, 295
 Admiral, High, of England Office, 363
 Admiralty, A Visit to, 860
 " Boards, Different, 365
 " First Lord of the, 365
 " Directions for Magnetic
 Station, 119
 " Division of, 362
 Admiralties, Irresponsibility of, 367
 Admiralty Order on American Yachts,
 65
 " Work, Division of, 364
 Adullamites. Why called, 204
 Aerial Navigation, 711
 Albums, Contents of, 10
 Alderney Breakwater, Cost of, 467
 Alligators at Grey Town, 7
 Amazon, Loss of H.M.S., 150
 " Mouth of the, 588
 " River Opened, 586
 American Admiral in England, 626
 American Yacht Voyaging, 270
 Amherst Point, Burmah, 328
 Aneroid Barometer, 126
 Anti-Scorbutics for Ships, 506
 Approval of the Review, 448
 Archimedes Screw Used, 483
 Archipelago, On approaching the, 553
 Arenas Punta Magnetic Station, 117
 Armour-plated Ships, 19
 Army Character injured in Jamaica, 377
 Army of England, Chief of the, 363
 Artificial Horizon, Ignorance of, 257
 Assam Valley, Ship, 403
 Atlantic Cable Laid, 275
 " Cable Broken, 469
 " Cable Repaired, 517
 Aurora Borealis, Sign of the, 126
 " " 651
 " Australia, 189
 Azimuth and Ampl. Tables, 111
 " Table, portable, 221
 Azores, Gulf Stream off, 143
 Aztecs, Traditions of, 420
 Balaclava Bay Scenery, 625
 Bank Failures, 278
 Barometer in the Minch, 127
 " and Winds, 662
 Barracks for Marines, Proposed, 304
 Bedford's, Capt., Plan for Buoying
 Coast, 326
 Bellerophon H.M.S., Cost of, 20
 Berths for Seamen, Law on, 508
 Biche de Mer, Account of, 611
 Black Sea, Voyage to the, 624
 Boat in the Bay, 27
 Boezem Explained, 482
 Bones and Tusks, Remains of, 112
 Bosphorus, Current up the, 554
 Bottle Paper—Indian Ocean, 291
 Brand, Lieut., Case of, 233
 Brand, Lieut., Acquittal of, 236
 Brazil, Ports of, opened, 586
 Brioni Isle, Banks off, 408
 British Empire, Wreck of, 689
 Brooker, Capt., in Japan Seas, 402
 Burmah Coast Navigation, 328
 Burdwood's Azimuth Tables, 111
 Buoys and Beacons, Intentions of, 326
 Buoys, Upright, recommended, 328
 Cabal Ministry—Why so, 361
 Cab Drivers in Genoa, 389
 Cadiz, Gulf of, Winds of the, 530
 " Gulf of, part considered, 530
 " Gulf of, Currents of the, 602
 " Gulf of, Tides in, 655

- Caldwell, J. B., Notes of Run from Monte Video to Valparaiso, 115
 Camboja—Nest of Pirates, 262
 Cameta, Port of, opened, 586
 Camphor Tree, Note on, 578
 Canal of North Holland, 544
 Candidates for the Navy, 433
 Capelle, West, Dykes of, 481
 Cardigan, Wrecks off, 91
 Caroline Mills, and the Island, 450
 Carrington's, Mr., Thermometer, 562
 Cases relieved by the Adelaide Navy Fund, 422
 Casualties, of Wrecks, Abroad, 336
 Cayenne, On making, 407
 Cellars of the Docks, 487
 Certificates of Voyages, 169
 Change in the Royal Navy, 205
 " Effect of, 267
 " in Heavy Guns, Effect of, 366
 Changes in Royal Navy, 423
 Charts, Importance of Correct, 432
 Charter of Greenwich Hospital, 299
 Chatfield Com., Nassau, Hurricane on, 70
 Chatham Naval Arsenal, 260
 Chefoo Harbour Light, 450
 China Coast Navigation, 157
 " Steamers, Size of, 461
 " Overland Route to, 628
 " Sea Dangers, 698
 Chisamel Castle, 14
 Cholera in the Lea, 200
 Civil Law and Martial Power, 237
 " cannot be Suspended, 242
 " Power of Crown to suspend, 312
 " and Martial Power, 312, 369, 428
 " Courts, 429
 Civilians cannot be tried by Court Martial, 242
 " Jurisdiction of, 319
 Close Channels, Road in, 337
 Clouds and the Weather, 175
 Coals at Arauco, Price of, 121
 Coal in Magellan Strait, 118
 Coaling at Monte Video, 115
 Coaling at Portsmouth, 259
 Coastguard, Residences of the, 435
 Coastguardmen's Duties, 434
 Cockburn, Chief Justice, on Martial Law, 235
 Coins of Japan, Names of, 618
 Coinage System, Japan, 614
 Coles, Capt., on Turret Ships, 309
 Colliers the rotten class, 672
 Collisions at Sea, 409
 Collision with an Iceberg, 350
 Collisions of Steamers, 180, 675
 Colon, Unhealthiness of, 218
 Colombian, Wreck of, 689
 Colorado Steamer, Hong Kong, 452
 Commanders of Merchant Ships, 256
 Committees—Routine in England, 367
 Constantinople, Remarks on, 555
 Constitutional Rights, English, 242
 Constructionists School, 476
 Consul at Genoa not easily found, 388
 Consul's Notice at his Office, 388
 Conway Prizes Distributed, 577
 Conway, School Ship, 574
 Cook, Capt.—Scene of his death, 418
 " Monument to, 415
 " Daughter of, 578
 Coolie Trade of Hong Kong, 515
 Coroner's Inquests in H.M. Ships, 572
 Corry, Rt. Hon., at Liverpool, 574
 Court Martial on Civilians Illegal, 236
 Crater of Mauna Loa, 495
 Crater of a Volcano, 415
 Crime of Murder Defined in One Case, 428
 Crimea under Siege, 624
 Cronstadt Time ball, 704
 Crystal Palace, Fire at the, 278
 Currents, Surface, 410
 " of Strait of Gibraltar, 529, 597, 604
 Current before Wind, 655
 Curtis Island, Pacific, 107
 Custom House and Admiralty, 433
 Danger Invited, 192
 Daniel Wood, Loss of, 434
 Dardanelles, On approaching, 553
 Dawson, Commander, on Manning the Fleet, 161
 Deaths by Slaughter at Jamaica, 374
 Defences of Portsmouth, 641
 Demerara Riots, 1823, 375
 Depots of Trade, Brazil, 586
 Destructionists School, 486
 Diana Whale Ship, Sufferings, 279
 Dinero, Mount, Appearance of, 116
 Direction Hills, 117
 Directions for Japan Coast, 288
 D'Israeli, Mr., Views of Martial Law, 284
 Distress Signal, 254
 Dock at Malta, 514
 Docks of London, 483
 " " United, 492
 " " Opened, 486
 " the Thames, 489
 " various, 524
 " and Crime, 481
 Donkey-boiler m...
 Douglas Reef, P...
 Draught of Water...

- Drained Lakes, 543
 Dream about Kamehameha, 556
 Dry berths for Seamen, 35
 Dungeness, Nature of, 116
 Dunkerque, Directions for, 407
 Duties of Officers in the Royal Navy, 424

 East India Docks, 484
 Easterly Winds of Gibraltar Straits, 531
 Electric Light, Effect of, 226
 Ellis on Madagascar, 341
 Emigrant Service Afloat, Evils of, 393
 " Ships, Abuses in, 351
 " Ships, Supervision Abroad wanted, 398
 Engineers, Ignorance of, 697
 England, Altered condition of, 261
 England's Marine, 473
 English Ships not English, 195
 Equatorial Current, 30, 291
 Ethnology of Abyssinia, 712
 Eruptions, Volcanic, 413
 Eruption of Mauna Loa, 1859, 494
 Executions in Jamaica, 239
 Explosions of Coal-pits, 201
 Eyre, Mr., Illegal Proceedings of, 236
 " late Governor, and the Law, 428

 Falcon, Wreck of the, 92
 Famine of Orissa, 201
 Farragut, Admiral, Tribute to, 626
 Females, Ships always, 485
 Fenian Privateer Captured, 632
 Festivities, Yacht, 64
 Filaments of Spiders accounted for, 533
 Fishing bank in L. Minch, 122
 Fishing-boat, Safety, 249
 Fitzgerald and Wright, Case of, 322
 Fitzroy's Charts, Remarks on, 121
 Fladda Huna Island, 12
 Fleetwing Yacht Accident, 62
 Floggings, Demerara riot, 375
 Flora MacDonald, 12
 Fogs on Portuguese Coast, 664
 Forecastle of the Mary Jane, 166
 " Merchant Ships, 195
 Forecasts for Seamen, Law on, 508
 " Wet, avoided, 35
 Foreigner's account of us, 360, 430, 483
 Formosa Banks, 157
 " South Coast, Notes on, 153
 Forts of Portsmouth, 641
 Fossil Ivory in plenty, 112
 Fouling of the Great Eastern, 168
 French Frigate Shoals, 457
 Friday, A Superstition of, 126
 Fuel for Steamers, 331

 Galatea, H.M.S., at the Cape, 573
 " Progress of, 401
 Gales, Winter, of January, 86
 " of the Minch, 125
 Gallant Port, Remark on, 119
 Genoa, A Glance at, 387
 Gibraltar Straits, Winds and Currents, 597
 " Considered, 529
 Goldsborough, Admiral, on Turret Ships, 306
 Gordon, Mr., Illegally Executed, 236
 " Illegal Death of, 374
 " Ferociously insulted and hung, 239
 " His slaughter—terrorism, 377
 Gordon Riots, Suppression, 369
 Gordon's Trial, Chief Justice on, 348
 " Case in Parliament, 240
 Gough Island, Position of, 18
 Government Duties in Rebellion, 319
 Governor's Duties in Rebellion, 313
 " Effects of their Systems, 430
 " of Colonies may be tried in England, 243
 " Trials of frequent, 372
 Gravier, M., on Shooting Stars, 172
 Great Eastern, Preparing, 168
 Greenwich Hospital, Origin of, 299
 " Disposal of, 298, 350
 " Could contain, 300
 " Cost of, 300
 " On its use, 561
 Grey, Mr. R. P., on weather, 176
 Grey Town, Marks for making, 4
 " Climate of, 4
 Guano Sale, Favour of, at Lima, 368
 Guayaquil River, its Light, 224
 Gulf Stream, Deviation of the, 144
 " Effects of the, 128
 " Remarks on the, 141

 Haarlem Lake Dyke, 481
 Hansen, Capt., His Sand-shower, 631
 Harris, The late Sir William, 163
 Hawaii, *see* Owhyhee, 353
 Hawaiian Travels, 216
 Hebrides, Visit to, 1
 Heckford, Capt., on Lights, 214
 " Collisions, 180
 " Steamers' Lights, 675
 Henrietta Yacht, Winner, 56
 " Log of the, 59
 Hickman, *see* London's Wreck, 137
 High Admiral, Office of, 363

- Highland Funeral, 11
 Hillsea Lines, 647
 Holland, Provinces of, 472
 Holyhead Breakwater, Cost of, 467
 " Harbour-Master a Justice, 511
 Home, Free, for Sailors, 472
 Homeward bound, Lines on, 27, 78, 131
 Hong Kong Harbour, 452
 " Island, 452
 " Population, 452
 " New York to, 527
 Honolulu Bar—Depth, 452
 " Harbour, Bar of, 340
 " and China Steamers, 451
 Hospitals for British Seamen, 50
 Hualalai, Account of, 354
 Hulks of Ships of War, 259
 Humanitas on Merchant Seamen, 101
 Hurricane at Nassau, 70
 " of Virgin Islands, 681
 Hydrographic Office, Admiralty, 430
 Hydrographical Office, 368
 Hydrography—Its Importance, 430
- Iceberg, Collision with an, 350
 Ignorance, Fatal effects of, 429
 " of the Law, 236
 " of Sailors, Instance, 389
 Ill-will against Mr. Gordon, 239
 Ill-found Ships, 383
 Importance of Hydrography, 430
 India from China, 573
 Indian Summer, Minc, 125
 Inland Sea Japan, Notes on, 581
 " Sea of Japan, 288
 Inspection of H. M. Ships Abroad, 508
 Institutions Perverted, 298
 Inundations of the Sea, 477
 Insurance, On paying, 473
 Iron Clad Fleet, British, 292
 " Ships, Lecture on, 19
 " Ships, Loss of, 465
 " for Wood, 204
 " —Weights of compared with Tonnage, 25
 Iron Ships, Protection of, 107
 Island, New one Stated, 450
 Islands of Pacific position, 45 ✓
- Jamaica Committee, Opinion of, 240
 " Laws, 312
 " Misgoverned, 201
 " Outrages, 233
 " Trials, 348
 James the First and London, 438
- Janus, H. M. Ship, Doings of, 573
 Japan, Coins of, 618
 " Hydrography, 287
 " Navigation, 579
 " South Coast, 158
 " The Mint of, 634
 " Rock of, 225
 Japanese Treaty, 295
 Jardine, Mr., Report of, 379
 John Gray, Shipwreck of the, 91
 Johnson, Mr. A. C., On Sumner's Method, 511
 Johnson's, Mr. A. C., Azimuth, 221
 Johnson, Mr. A. C., On Reducing to the Meridian, 394
 Jungle Fires—Burmah Coast, 328
 Justitia on Greenwich Hospital, 561
- Kagga River, Calcutta, 325
 Kamehameha, Vision of, 556
 Kanavi Rock, Remark on, 533
 Ke-ala-ke-akua Translated, 418
 Kiddle, Mr., on Aurora, 651
 Kii Channel, Japan, 290
 Kilauea Crater, Account of, 559
 Kind Words Recommended, 472
 Kings of England Amenable to Law 370
 Kurrachee, Directions for, 104
- Labour at Nicaragua, 2
 Labourers of the Docks, 490
 Lacon Isle of, Note on, 112
 Ladrone Island, Resources of, 541
 Langstone Creek, 647
 La Peyrouse, Where Lost, 412
 Lashes given to Negroes, 375
 Lava falling into the Sea, 499
 " warm beds, 501
 " stream, Length of, 414, 415, 498
 " stream of Mauna Loa, 496
 Law, Civil and Martial Power, 312
 " Duty of Maintaining, 373
 " English general, 376
 " Ignorance of, 428
 " Not to be Superseded, 370
 Lead, Neglect of, 191
 Lean, Captain, Escape of, 382
 Legislation, Subjects for, 148
 Letter to a Ship Captain, Curious, 383
 Levanter of the Strait, 530
 Lewis Island, Note on, 8
 Lieber River, Coal at, 121
 Lieutenants—Navigating, Duties, 424
 Life-boat Institution, 566
 " Services, 86
 " Number of, 208

- Life-boat Proceedings, 512
 " Institution Proceedings, 38
 " Proceedings 634
 " Institution, 449
 " Institution, 205
 " Institution, 283
 " Institution, Proceedings, 109
 Life lost, Greatest on East Coast, 673
 Lights on Coast of Burmah, 328
 Lights, U. S. Re-Established, 50
 Lights of Ocean Steamers, 214
 Lilliputian Ship, 277
 Limejuice Inspection Proposed, 87
 " Act of Parliament, On, 506
 " wanted at Sea, 196
 Line of Battle Ships, Sale of, 205
 Linosa Island, On the Chart, 553
 Little Minch Channel, 122
 Liverpool Port, Wreck off, 52
 " Ships, Wrecks of, 90
 Lives saved by Life-boats, 211
 Lloyd's Lieutenant, Doings in China, 573
 Load Line for Merchant Ships, 385
 Lobos Island Light sacrificed to Seals, 115
 Lochs of the Western Islands, 14
 London Ship Foundering, 138
 " " Her last hour, 132
 " " Lines on Wreck of, 78
 " " Narrative of her loss, 29
 " " Boat Saved, 28
 " " Her Crew, 131
 Loochoo Group, 542
 Lord Chief Justice, On Trials, 348
 Luminous Sea—Why so? 19
- Macareos Term Meaning, 538
 Mackarel Sky, Sign of, 175
 Macneil, Story of, 15
 McInnes's Composition, 168
 Madagascar Revisited, 341
 Maddy Loch, Account of, 13
 Magellan Strait, Opinion on Navigating 121
 " " Length of, 121
 " " Entering, Caution, 116
 " " Remarks on, 126
 Mail Steamer Atrato, 709
 Malice Implied by Law, 247
 Mammoth Tusks and Bones, 112
 Man of War's-men, Dress of, 433
 Manning the Fleet, 161
 Mansfield, Lord, On Civil Law, 239
 " " Allusion to, 372
 Marianople and London's Boat, 28
 Marine Legislature, 147
 Mark Twain's Dream, 556
 Marmora Island, Caution, 554
- Martin, Captain, Last Words of
 Mary, Queen, Founder of Greenwich Hospital, 299
 Martial Law unknown to Civilians, 242
 " " Power of Declaring Repealed, 430
 Martial Law Illegal, 236
 " " Defined, 235
 " " What it is, 247
 " " Order on Declaring, 429
 Masters R. N., Term Abolished, 427
 Maulmain, Dangers off, 329
 Mauna Loa, Eruptions of, 355
 " " Condition of, 505
 " " Vision of, 556
 " " Volcano, 413, 354
 Mediterranean Winds, etc., 111
 " " Tides, 520, 657
 Mercantile Marine Officers, Qualifications, 113
 " " Measures, 678
 Mercator on Rules of the Road, 150
 " " Forecasts, 36
 " " Seamen's Berths, 148
 " " West Indian Packets, 99
 Merchant Shipping Act, 506
 " Fleet Cradle of the Navy 438
 " Seamen, Condition of, 335
 " Ships, Ill Condition of, 195
 " Seamen, Exposure of, 621
 " Ships, Wants of, 196
 " Seamen, Discomforts of, 35
 " Navy, Its rotten System, 386
 " Marine Officers' Qualifications, 695
 " Seamen, Report on, 385
 " Seamen, 169
 " Seamen, How Neglected, 622
 Meteorologic Observations, Note of Board of Trade on, 51
 Meteorology, Lisbon, 600
 " Remarks on, 125
 Meteors and Weather, 171
 Mexicans, Ancient, at Owhyhee, 420
 Miantonomoh, Remark on, 23, 308
 " " Steamer, Course of, 187
 Miller, Captain, on Maulmain, 329
 Minch Channel, Little, 8
 " Little, 122
 " Depth of, 124
 Minotaur, Cost of the, 20
 Mississippi, Light in the, 49
 Mint of Japan, 614
 Monetary System, Japan, 614
 Monitor Yankee, 267
 Monitors Neglected 309
 " Versus Ironclads, 306
 Monte Video to Valparaiso, 115
 " " Route on Leaving, 115
 Moon, Effect on the Weather of the 18th

- Preventive Service, Men of, 433
 Progress of England, 111
 Prussian Ship of War, 108
 " Merchant Marine Officers, 113
 " War, Causes of, 196
 Prince of Wales, Patron of Life Boats, 206
 Prosperity, English, Cause of, 493
 Pulo Condore, 262
- Quaker City, Proposed Trip, 399
 Qualifications for Commanders, 266
 " for Merchant Marine Officers, 113
 Queen Adelaide Naval Fund, 420, 665
 Quod, Cape, Remark, 120
- Radama, King, Character of, 522
 " Death of, 341
 Rasa Island, Non-Existence, 542
 Rebels must be tried by Civil Law, 244
 Red, White, and Blue, 277
 Reduction to the Meridian, 894
 Reed, Mr. E. J., on Plated Ships, 19
 " on Turret Ships, 310
 Reform Bill, Meeting, 203
 Refuge Harbours, Cost, 466
 Rennell's Current, 603
 Reserve, Royal Naval, 161
 Responsible Rule, the Law of England, 372
 Retrospect of the year 1866, 267
 Review of the Year 1866, 192
 " Naval ver Military, 442
 " Ships of, 443
 Rhone Steamer, Loss of, 684
 Rincon Rock, Destroying, 470
 " St. Francisco, 339
 Ritual, The Schiams on, 198
 Rollers, 660
 Rossell Island, Massacre near, 379
 Rotten System of our Merchant Navy, 386
 Rotumah Island, Pacific, 106
 Royal Navy in Commission, 458
 Royal Society's Conversazione, 226
 Rulers, Where Criminal, 372
 Rule of the Road, 180
 Rules of the Road, 337
 Rules of the Road, Bad, 409
- Sailors' Homes, Improvement of, 678
 Seamen's Wants, 678
 St. Catherine Hospital, 490
 St. Paul Ship, Where Wrecked, 379
 " Massacre, 378
 St. Vincent, Gulf of, Directions, 47
 Sainthill Bank, Remark, 142
 Samoan Islands, Pacific, 106
 San Quan River, 7
 San Francisco Harbour, 339, 470
 " and China Steamers, 451
 Sand Shower at Sea, 631
 Sandwich, Island, Voyage to, 263
 Saypan Island, Position, 541
 Sack, Origin of the Word, 487
 Schermerboezem, Dutch, 543
 " in Merchant Ships, 228
 Scurvy, More of it at Sea, 633
 " Scourge of Merchant Ships, 400
 Seamen, Merchant, Deficiency of, 41
 " English Failing, 194
 " On Illness of, 508
 " Mediterranean Inspection of, 67, 510
- Sea-slug, Account of, 611
 Self-government, English Principle, 368
 Settlement of Magellan Strait, 117
 Severn Ship, Case of, 272
 " Scuttling of, 219
 Sextant Collimation, 182
 " Failings, 187
 Sheringham, Admiral, On Portsmouth Bars, 97
 Sherry, The Wine called Sack, 487
 Ship-broker of Liverpool, 381
 Ship Owners and Commanders, 473
 Ship Captain Threatened by a Liverpool Ship-broker, 383
 Ship, The Home of Sailors, 472
 Ships of England, 485
 Ships, Increased length of, 29
 Shooting Stars and Weather, 170, 176
 Simonoseki Strait, 290
 Skyring, G. W., to his memory, 161
 Smuggling on Cornish Coast, 432
 Smyth, Admiral, Word-book, 568
 Snakes at Grey Town, 6
 Spiders' Webs with East Wind, 532
 Sponge Diving, Perils of, 215
 Sport in the Little Minch, 123
 Sourabaya, Maritime Arsenal, 261
 " Roads, Buoys in, 223
 Southsea Castle, 650
 Spithead Forts, 648
 Squid, Remark on, 190
 Steam to Japan, 620
 " Trip of pleasure, 399
 " Power to be relied on, 25
 Steele, Captain, on Stewart Island, 540
- Safety Fishing Boat, 249
 Sailing Rate of Yachts, 56
 Sailors of H.M. Ships Distinguished, 433
 " Word-book, 568, 693

- Steinmetz, on Weather, 175
 Stewart Islands, Discussion on, 540, 609
 Storehouses of Stocks, Contents, 486
 St. Thomas Island, Purchase of, 683
 St. Thomas' Lighthouse Destroyed, 689
 Sub-lieutenants' Duties, 425
 Sultan, His Proceedings, 441
 " of Turkey in England, 440
 " at Naval Review, 445
 Sumner's Method, Improved on, 511
 Sunday at the London Docks, 621
 " in the Hebrides, 127
 Sun rise and setting in the Tropics, 16
 Superstition of Hebrides, 15
 Surface Currents of the Sea, 410
 Suwonada or Inland Sea, 288
- Tapajoz River Opened, 586
 Taxes in Jamaica, a Picture, 430
 Taymouth Castle Wreck, 95
 Tea Ship Race from Chin, 899, 573
 Tea ships List of, 517
 Telegraph Cable, Jersey and France, 291
 " Thermometer, Wheatstone's, 227
 Terror, Reign of, Occasioned by Planters, 375
 Terrorism is Political Assassination, 377
 " in Jamaica, 377
 Thames, Leave us the, 438
 Thames, River, Importance of the, 438
 Themis Yacht, Voyage of, 263
 266
 " Visited by Emperor of Brazil,
 Thermometer, Converting, 562
 Theodore, Emperor, Cruelty of, 630
 Tide Table, 1867, 694
 Tide Traps, Dry Harbours, 193
 Tides on Spanish Coast, 656
 Tones, Wolf, Case of, 322
 Tocantins River, opened, 586
 Torbay, Lines on, 193
 Towers, Pictish, on Lewis Island, 8
 Toynbee, Capt., on Merchant Seamen, 37
 Trade, Board of, on Meteorological Observations, 51
 " Wind in the Atlantic, 141
 Training Ships, Proposed, 37
 Trainore, Wrecks of, 91
 Trepang, Account of, 611
 Tricks on Voyagers, 17
 " on Merchant Ships, 383
 Turbaries of Holland, 550
 Turret Ships, Report on American, 806
 " Remarks on, 23
 " American, 306
- Unseaworthiness, 470
 Utopia, Loss of Ship, 880
- Vaults of London Docks, 486
 " of the Docks, 488
 Vendaval, Meaning of the term, 537
 Vendaval Wind, 599
 Vesey, Captain, on St. Thomas's Hurricane, 686
 Vessels made away with, 220
 Victoria Dock, London, 491
 Virazon Breeze Explained, 584
 Virgin Islands Hurricane, 681
 Virgins Cape, Appearance of, 116
 Volcanic Eruptions, 494, 500
 Volcano of Mauna Loa, 494
 Voyages, Long and Short, 169
- Wakefield, Port, Directions for, 47
 Wallis Island, Pacific, 106
 War, Cause of the Abyssinian, 629
 Warrior, H.M.S., Cost of, 20
 Wasps at Grey Town, Size of, 6
 Wassaree of Para, 594
 Water-closets in West India Steamers, 36
 Waterfalls of Owhyhee, 416
 Waterstaat of Netherlands, 479
 Waterwitch, Account of the, 269
 Way, why so spelled, 568
 Weather Forecasts, 27
 " Sudden Changes of, 124
 " Highland, Signs of, 126
 " and the Moon, 180
 " and the Tides, 180
 " and Shooting Stars, 176
 Webs, Spiders', with E. Wind, 532
 West India Packets, Deaths in, 99
 " " Docks, 439
 Westerly Winds of the Strait, 585
 Wet Berths of Seamen, 43
 Whiskers, A Ship's, 569
 Wilson, Wreck of the London, 137
 Winds of the Minch, 125
 " Effect of, in Holland, 483
 " of the Strait of Gibraltar, 397
 536, 597
 " most Fatal at Home, 674
 Windmills used in Holland, 483
 Wine of the Docks, Value, 489
 Wines, French, why disliked, 486
 Wire Rope, Weight of, 160
 Wolfe Tone, Case of, 322
 Wooden Walls Superseded, 204
 " Ships, On Converting, 23
 Worcester, Training Ship, 403
 Wreck Register for 1866, 669

Wrecks from Winter Gales, 86
 „ at New Brighton, 52
 „ Number of, 209

Yacht Club, number of Yachts, 399
 Year 1866, Review of, 192

Yacht Voyage, 263
 „ Ocean Voyage, 270
 „ Race, American, 55

Zealand Dykes, 481
 Zealand, or Sea-land, 476
 Zembra Island, Height wanted, 552
 Zuyder Zee, Formation of, 477

LIGHTS.

Aden, 405
 Africa Rock 579
 Algiers, 521
 Amelia Island, 636
 Andanan Island, 286
 Aranzas, 468
 Arklow, 579
 Arni Cape Del, 435
 Assateogue, 579
 Berdiansk, 345
 Brackwater, 572
 Brindisi, 695
 Bombay, 636
 Bulk, 695
 Burriana, 636
 Canaveral Cape, 405
 Chifu, 636
 Codling Bay, 579
 Chipiona, 636
 Crooked Island Passage,
 521
 Cumberland Island, 579
 Faludden, 695
 Dungeness, 405
 Egga Harbour, 463
 Femero, 695
 Flensburg, 795
 Friedrichsort, 695
 Gannet Rock, 405
 Gaspa, 286
 Georgetown, 345
 Gottland, 345

Heg Holm, 636
 Homlung, 636, 695
 Hooper Strait, 579, 636
 Jacmel Bay, 286
 Jane Island, 636
 Judith Point, 405
 Kind Island, 636
 Kolaba, 536
 Ledskar, 695
 Lefchimo, 636, 695
 Leghorn, 405
 Lian River, 695
 Lonsdale Point, 345
 Lucifer, 579
 Maritime, 579
 Messina, 405
 Mortar Island, 405
 Naples, 695
 Natal, 345
 Normontier, 405
 Nerva I., 695
 Orfordness, 636, 405
 Otranto Cape, 521
 Para River, 579
 Patterson Rock, 636
 Paternoster, 345
 Pembroke, 636
 Pertuis Breton, 405
 Plane, Castello de, 354
 Ponza Island, 636
 Port au Prince, 286
 Prince Edward Island, 463

Ramsgate, 579
 San Juan, 695
 Sauw Island, 405
 St. Augustine, 405
 Sata Croce, 405
 Schelde, 636
 Sli, 695
 Skaw, 695
 Soderarm, 345
 Sonderburg, 695
 Sombrero, 636
 Spartivento, 579
 Spezzia, 345
 Spithead, 405
 Spitsand, 636
 Spurn, 405
 Stabben, 636
 Stockholm, 345
 Stot. Sesquier Island, 636
 Svartklubb, 345
 Takolai, 405
 Taranto Harbour, 521
 Timballier, 345
 Trieux, 695
 Tybee Island, 636
 Understen, 345
 Warderobod, 636
 Waterford, 463
 Weymouth, 405
 Wicklow, 579
 York, 695

OCT 30 1931

