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AND

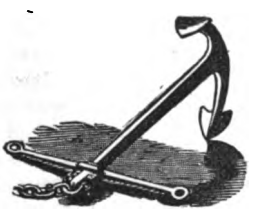
NAVAL CHRONICLE

FOR 1868.

A JOURNAL OF PAPERS

ON SUBJECTS CONNECTED WITH

MARITIME AFFAIRS.



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My Trip to New York.

During the grand struggle between the Northern and Southern States of America, I took on board a large cargo of cotton at one of the Mexican ports for New York. As it had come from Texas in sundry blockade runners, grave doubts were entertained that the Custom House officials might raise doubts on arrival; but having taken the precaution to land it on Mexican soil before leaving, I felt pretty easy on this rather delicate point, for I believe it was without precedent.

This cargo was a very good example of the enormous fortunes which were realized during the war. It had been bought in Texas at fifteen cents per pound, sold in a Mexican port for thirty-nine cents, and, a fortnight afterwards, fetched eighty-seven cents in New York.

We had fifteen passengers on board, one of whom had run the blockade in a schooner, but, through ignorance of nautical affairs, had been wrecked in the lower part of the Gulf. I believe he was a Yankee, but always passed for a Canadian. His dry humour often amused us during the voyage, but, like many of his countrymen, he had rather a contempt for an Englishman's love of the bath. As we neared New York, one of those biting north-westers came down upon us, and from great exposure, I got chilblains on two of my fingers. He remarked, "Well, Cap'en, you are always getting into a bath, and must expect them things Now I never took a bath all my life, and never had a chilblain. I can tell you another thing which happened to my daughter. I had been away to China for two years, and when I returned I found her looking mighty bad. 'Wife,' says I, 'what's wrong with Sally?' 'Well, I don't know; she's been ill near about a year. Doctor makes her take a bath every morning.' 'Bath!' says I, 'That does it. I'll have no more of them.' In a few days she was a'most well; and you should see her now,—fat as a porpoise."

I was very glad to get a New York pilot on board after our very stormy passage. These men, either from their constant intercourse with Englishmen, or from voyaging to foreign countries, lose much of the peculiar manner of speaking which their countrymen have, and are fine hardy fellows. In the heaviest weather they are ready to board a ship; and it is almost impossible to near the coast without being pushed up by one of their magnificent pilot schooners.

Our first words were, "Is Charlestown fallen?"—for on that depended the success of the voyage. "No; and not likely to for many a day." Crossing the bar, we stopped off Staten Island for the Health Boat, and I was much annoyed at a little "contretemps" which ensued. The main discharge pipe was well out of the water, and, just as the boat touched the side, the engineer, not wishing the condensers to fill, moved the engines without orders, and sent a stream of water into the boat which drenched every one to the skin. Having obtained pratique, we steamed on for the City. I was much struck with the noble bay, and admired the wisdom of its founders in choosing such a site. Probably no city in the world is so well situated for commercial purposes, standing, as it does, at the mouths of two deep rivers, with quays and wharves running for miles along both, and capable of almost unlimited extension. The largest ships lie afloat at all times close alongside, and take in or discharge their cargoes.

On landing, I had to go to the City Hall to answer sundry questions of the authorities. I must acknowledge that, to use one of their own remarks, I felt considerably dumbfoundered when I understood what was expected of me. A dialogue will, however, best explain it. My interrogator was a mild-looking gentleman, with a good-humoured leer in his keen grey eye.

"Well, Captain, you have a large quantity of cotton on board. I hope a lot of it belongs to yourself, for it was a bold stroke your bringing it here."

"I am sorry to say that not a bale is my property."

"Ah, that's bad! But anyhow the owners of it ought to give you a dollar on every bale. They will more than double their money in a fortnight. Now then, let us to business. Here is your list of passengers. I want all the particulars concerning each. Thomas Smith,—where was he born? What is his age, his height, colour of hair, complexion and eyes? What is his profession? Where does he come from? Is he going to stay long in the States, or is he going back with you? Has he any peculiar marks about him? Is he married or single."

I stared in blank amazement to be asked such questions about people whom I had never seen till they came on board, and, owing to sea-sickness, some not then. Seeing my amazement, he said, "Come, you will recollect enough about 'em. Go a-head!"

I described each to the best of my ability, and told him I would not be answerable for its correctness. He then handed me the Bible, and said that was all he required. Seeing that I was not satisfied to swear to the correctness of my statement, he added, "Well, Cap'en,

since you are so squeamish, you can put your nose to the book, that will do us. Your agent will pay the head-money." Thus ended my interview here.

In New York all the regular line of steamers have their appointed wharves to go to, and the pilot takes them alongside on arrival. But, before the casual caller can obtain one, he sees a practical proof of the much-boasted Republican institutions. I went to the Harbour Master's Office for an order to go alongside a wharf to discharge the cargo. There was no berth vacant, was the reply, either on the James or East rivers. But I had seen several, and, pulling out my pocket book, I enumerated them. "I guess they are all taken, sir. The 'Jane Woodfoll' goes there, and the 'Flying Eagle' here, etc., etc.; and this,—Oh! that is going to be rebuilt. I left in despair, and went to the consignee. He laughed, and said, Oh! you are not acquainted with our institutions. The Harbour Master goes in with the Government, and their tenure of office being short, they will do nothing without a bribe. I will send one of my clerks with fifty dollars and arrange the business. We returned thus armed; but I had nearly spoiled the whole by innocently offering the head man the bribe. His subordinate, however, gave me a quiet nudge, and said, "You don't suppose that officer could be bribed, do you, give it me, I'll fix it for you." I subsequently learnt that the head man was a butcher, who had never been to sea in his life, but who at the election had commanded the greatest number of votes, and was returned accordingly.

The berth was high up on the East River, and I soon discovered that nothing was safe without the most vigilant watch was kept day and night. In order to be on my guard, I hired a policeman for two and a half dollars a night. All went well until the cargo was nearly discharged, when one night I was aroused from my sleep by shouts, throwing of stones, etc. Hurrying on deck, I met the policeman returning on board, very much out of breath, and swearing in a fashion which only Yankees can do.

"What is the matter?" said I. "Well, Cap'en, I guess I've 'arned them two and a half dollars this night, anyhow! Some darned thieves tried to steal one of them zeroons of cochineal. Did you not hear them a stoning me?" I thanked him for his zeal, and next day informed the consignee of the incident. He looked grave, and said, "Have you counted your cotton bales on the quay?"

"No? Then do so, for depend upon it that policeman is a rascal who is in league with thieves, and pretended to protect the cochineal while his confederates helped themselves to something else. I know their tricks well, but am afraid nothing can be done, our police are so bad."

On returning to the ship, I found a bale of cotton missing, but could never find any traces of the thieves. I discharged the policeman, who had the cool impudence to ask me for a gratuity, and a letter of recommendation to any captain who might require his *trustworthy* services!

All nations, except England, have a treaty with the United States by which deserters are given up to merchant ships or retained in jail

until the ship is ready for sea. This arrangement gives foreign ship-masters a great advantage over English. The former have only to complain to the police if crews desert, and steps are immediately taken to secure them. With us it is different; for no sooner does the ship touch the wharf than she is pounced on by a swarm of crimps,—scoundrels who surpass in rascality their brethren in England in villainy. Now it so happened that New York was not mentioned in my Articles of Agreement, but being only a port of call on my way home, neither myself nor the Consul thought it any infringement to go there. The crimps, however, held out such inducements of high pay, and persuaded Jack that their laws would compel the payment of wages to the date of their arrival in New York if they wished for their discharge that fourteen immediately refused duty. Now, in New York all the work of loading and unloading is done by stevedores and lumpers. I was, therefore, easy on that point, and stopped their rations. As I had expected, they all left the same day; and shortly afterwards I received a summons to attend the Court and show cause why I refused to pay Mr. John Smith the sum of two hundred and thirty-seven dollars for wages fairly earned. I must explain that the American law allows any number of seamen belonging to one ship to make their claims for unpaid wages in the name of one of their body—hence the large amount claimed by Mr. John Smith.

I forget the name of the Court where the case was to be tried; but on arriving there, I found His Honour the Judge sitting on a stool behind a high desk, with his hands in his pockets, and his hat over his eyebrows. His great object just then appeared to be to work the stool backwards, until his shoulders touched the wall, and then jerk himself upright again. When my case came forward he called out, "Who appears for the defendant?" "I do," said a determined looking man, to my great surprise, for I had resolved to conduct my own case,—"and may the case be dismissed?" "On what grounds, Judge?" (I must remark here that the judges, like every other official, are elected for the term of the Presidentship only, and then retire into private life, although they never lose their title). "That you have no jurisdiction here over this case," was the answer, "and it must be tried in the Marine Court." "Then the case is dismissed," said the Judge. I thought it singular that a Judge should be on the bench who did not possess a sufficient knowledge of the law to know what cases came under his jurisdiction. Trifling as this incident is, it is not a bad exponent of the vicious system pursued in America. I thanked my defender, who refused any fee, and withdrew.

Having informed the Consul, he said, "Your troubles are not yet over. They will have you up before the Marine Court, and there you will not have the slightest chance against a sailor. I will, however, give you a certificate under my seal stating that having in the presence of both parties investigated the case, I find the men have no cause of complaint, and are deserters.

The next day I received a summons to attend the Marine Court. When my case came on I walked up to the Judge, and handed him

the English Consul's certificate of desertion. Casting a contemptuous look at the consular seal, he exclaimed, "We don't acknowledge that thing here!" and, amidst applause, threw it violently from him. For some reason, I believe, that a trial cannot come off until four days after the charge has been made. My case was put off till the following Monday, and this was on Friday, and I was ready for sea. It is by such trickery as this that a shipmaster is frequently compelled to pay an unjust claim for wages as the Court is aware that a steamer must sail to time. I was determined not to yield to such injustice as to pay the claim, and resolved to leave the case in the hands of my consignees and get bail for the ship. Having gone to a lawyer recommended by them. I was surprised to find he was the gentleman who had behaved so handsomely in the first Court I was summoned to. Having given him a careful sketch of the affair, he informed me that he could arrange it for a few dollars. "How?" I asked. Oh! I know the lawyer well who is for your men. One of those low rascals who is always on the look out for such dirty jobs, but is at all times ready to throw his clients overboard provided he can ensure his fees from the opposite side. Meet me there at two o'clock this afternoon.

Great was my annoyance on returning to the ship to find a sheriff's officer in charge, who presented me with a very small and very dirty card, on which was marked "Judge Lynch." The officer was a very civil young fellow, and informed me that he had only just been elected to his appointment, and bewailed his hard fate at having to remain by the ship on Sunday in lieu of walking with his lady-love. I informed him that I had strong hopes of adjusting the claims that afternoon, and wished him a pleasant morrow. At two o'clock I rejoined my lawyer, and found him closeted with his opposite member. The following dialogue then took place:—

Mine—"Winthrop," (I remember the fellow's name) "the Captain here will give you fifty dollars to quash this affair, as he is ready for sea, and does not want to be delayed." Opposing lawyer—"Judge, you must think I'm mighty foolish to give up such a case as mine for the small sum of fifty dollars; besides, do you think I would sell my clients in such a way?" Mine (with supreme contempt)—"You sell your clients? Yes, or anyone else whom you could make a cent by. I will increase it to sixty dollars, and (pulling out his watch and laying it on the table) I give you ten minutes to consider over it; so go into the next room, and please yourself about returning. But, mark me, Winthrop, you know me well, and if you are fool enough to refuse not a penny will you get.

Before the time had expired the door opened, Winthrop walked in, and said, "Well, Judge, I guess I'll take them sixty dollars, but you are mighty hard on a fellow,—and what will my clients say?" "Bah! Sit down and write a receipt, and when the ship is clear you shall have the money."

I now related the seizure of the ship by the sheriff's officer.

"That is awkward," said the Judge "as the Hall is closed. To-morrow will be Sunday, and by Monday your ship would be seized

again. Here, Winthrop! the Captain says the officer is green, sit down and write a note to him stating that the dispute is settled, and he may pack up and be off. He won't know any better, and Judge Lynch may settle the matter with him afterwards." Then, turning towards me, he said coolly, "Should he not take the bait, Captain, pitch him overboard."

I suggested that it would be better to take him to sea, and put him on board a pilot schooner outside. "Ah! that's better," said the Judge.

The sheriff's officer greedily swallowed the bait, and left immediately. I then made arrangements with the crimp to have the seamen I had engaged for the run home brought on board at daylight, after I was clear of the wharf. For, be it understood, when these gentlemen have put their charges on board they use every means to favour their desertion, and the whole of the seaman's wages having been expended, he is only too ready to meet their views. Bad as the crimping system is in England, it is not half so atrocious as it is in New York, where it is legalized. In the former the sailor has a certain amount of clothing and a bed of straw given him, but in New York, those who were mustered on the quarter-deck of the —— on that dreary Sabbath morning had neither beds, blankets, nor a change of clothes! Although it was the end of November, many were scantily clad in a pair of dirty ducks and a checked or ragged flannel shirt. My heart almost failed me on enquiring into their profession, for I saw at a glance that not more than three of their number were seamen. One had been a drummer in Meade's army, a second a homœopathic doctor, a third a pastry cook, and so on. Amidst the storms of a severe winter passage this subsequently pressed heavily on me and the few good seamen on board, as it was impossible to get many of them out of their berths. For the first time in my life I felt there was some excuse for the bad treatment which men received in American packet ships, for there are times when the aid of all is frequently a question of life and death, and I was subsequently so placed.

As we were leaving the wharf a clerk from the broker's office came down in great haste to inform me that, believing I could not get clear of the Court, they had forgotten to take out the pass for the guard ship at Staten Island, without which no ship could go to sea. I resolved to try it, even if stopped, as I was informed I was sure to be.

A second difficulty now sprang up in the shape of a dense fog, and the pilot refused to move until I had taken all responsibility. This I immediately promised, and, after clearing the city, the fog lifted a little, but a thick drizzling rain followed. As we neared the guard-ship, the pilot said, "Have your pass ready, sir." All ready, I replied, showing him a large official-looking envelope which I had picked out from among my papers. The rain poured down, and I could see the guard-ship crew under their awning waiting to go into their boat, so, steaming up close alongside, I held up the envelope, called out, "Here you are, sir!" and the next moment a puff of wind blew it out of my hand into the sea. Being judiciously weighted, it

sank before the boat could reach it. On seeing this the American officer good naturedly called out, "All right, sir! go a-head!" Shortly afterwards the fog again closed in, and we were compelled to anchor in the Narrows. So thick was it, that not long afterwards we heard a large steamer run on shore. Although we could not see her, but subsequently heard it was one of the Inman line, from Liverpool.

The following morning we bade adieu to New York, and with a light fair wind started for England. I believe I have remarked that all the blades of the propeller were broken, and now the ship was deep no more than six knots could be attained under steam alone. Nothing of importance occurred until we were launched to the eastward of Cape Race on the Great Circle for Cape Clear. The barometer had fallen slowly with the wind from north-west (always a bad sign), but I had resolved to run, as the gale had increased so fast that I could not with my crew handle the heavy topsails and foresail although close reefed.

Some of the events which occurred on this passage may be deemed fabulous, as it is scarcely within the bounds of possibility for any ship to be nearer destruction than mine was without going altogether. In a few hours the wind was blowing a hurricane, the ship scudding dead before it to the south-east. The biting north-west wind appeared to blow through us, and hail-stones, as large as Barcelona nuts, cut our faces when driving before the fierce squalls. Except in these squalls the sky overhead was clear, but the horizon was never visible, being enveloped in a dark slate-coloured haze. The sea was streaked with long lines of white foam, or covered with spoondrift, and the waves surpassed in height and magnitude any I had ever seen in the course of many years of a sea life. While the crest of one was rolling a-head of the jib-boom, the next would be far a-stern, so that our ship looked no larger than a gull between such huge masses.

Our first narrow escape was in this wise:—At eight o'clock in the evening I was standing on the break of the poop, looking with a mingled admiration and awe at the giant waves rolling and breaking under the moonlight, sometimes so close that it appeared impossible to clear them. Suddenly the weather helmsman shrieked out in a tone of despair, "The rudder is broke!" Running aft, I put my hand to the wheel, and felt in a moment that its connection with the rudder was gone. Amidst all the din of the storm those words of the helmsman had penetrated below, and every soul on duty, including the skulking wretches who had remained below since the gale commenced, were on the poop in a few minutes to man the relieving tackles. During this interval, I cannot say how long, the hand of God (I write it with all reverence) had alone steered the ship as she scudded at twelve miles an hour over that terrible sea. On she went, like the flight of an arrow, neither diverging to the right hand nor to the left. I must here explain that the rudder was not broken, but the steering apparatus having been originally keyed on the wrong way by some unskilful mechanic, had from the unusual strain loosened the key and slipped out of gear. In a few minutes, with the aid of the staves of a bucket, the wheel was again serviceable.

After midnight the wind lulled suddenly, and now came another danger. With sail, and the engines driving at seventy-six revolutions (contractor's speed was fifty-two), we had succeeded in keeping before the sea. But this lull reduced the speed considerably, and in a few minutes we felt the dangerous effects. One wave had broken a little short; the second came on, and I held my breath. It rose (I am not romancing) as I had remembered seeing in my youth a huge boa constrictor rise over a rabbit, and broke clean over the heads of the men at the wheel. I thought that men and wheel must both have been swept away; but like English seamen, when the wave cleared away, they were standing coolly at their stations, although one was seriously injured. It then ran along on either side, leaped into the life-boats on the bridge, and split them in two like the blow of an axe, flattened a third, which was turned bottom up on the main hatch, and filled the waist with water. This made the ship so sluggish that she appeared to stand still in the water; and fully expecting a few succeeding waves would wash us all overboard, I said to myself *Foundered at sea.* Mercifully no wave of importance followed this till the waist was again clear, and thus we escaped.

From this period of our voyage to England we had constant bad weather, and I have seldom felt more thankful than when we ran alongside of the dock wall in the Mersey, and I saw my New York runners leaping on shore without waiting to make the ship fast. Poor fellows! their kits were, if possible, scantier than when they came on board on that dreary Sunday.

I have crossed the Atlantic since many a time in winter and summer, but have never met with such a gale as that of November, 1863.

NOTES DURING A VOYAGE BETWEEN ENGLAND AND THE BLACK SEA.

(Continued from page 625 last Volume.)

THE advantage of a short paper is that if it has in it anything of a useful practical kind, it is likely to be noticed; and as my last "notes" were short enough to claim such an advantage, I hope the remarks about backing an anchor, when there is no room to drive will not escape the attention of seamen. How many vessels would be saved by adopting this practice when requisite, may be inferred from the simple fact, that to one ship foundering at her anchors, there are a hundred wrecked by driving on shore, and although a good offing is always to be preferred to a doubtful anchorage, yet it is to be observed that a ship with good ground tackle has often ridden out a very heavy gale in a troublesome sea, by backing the anchor with a kedge, and running over the whole cable. But to return to Balaclava Bay. About noon the signal was made for the transport *Dinapore* to enter the harbour, and seeing a steamer on her way to us, our anchor was up

and hawser ready by the time she got alongside, and we entered the harbour in so hard a squall that nothing but a very quick helm and a sharp look out kept us from knocking against the rocky sides of this narrow entrance. The first sight of Balaclava harbour with its cram of ships, and its surroundings of tents was one to be remembered, and as there was not a vessel among them, without war material or provision for the army on board, it impressed one with a sense of very earnest, real war going on, and the whole scene was an immense camp, with a steep shored lake full of the invading fleet in the centre.

We warped into our berth near to a ship loaded with *gunpowder*, and as a vessel was towed out on fire the same day, and we had other alarms of fire afterwards, we never felt quite easy about our neighbour, for glad as seamen always are to shut the sea gates, especially after a month's voyage, we wished ourselves on the other side of them whenever we heard the alarm of fire rung out from the bell of every ship in the harbour. This would sometimes happen at night, and then there was no certainty whether it was not an accidental blaze or a Russian fire ship crept in under cover of darkness. Had this been an English harbour full of Russian ships the whole would have been destroyed by fire without any extraordinary skill or daring, and it appears a strange circumstance that the Russians made no attempt of the kind, for with their knowledge of the entire navigation of the Black Sea and the waters connected with it, I don't see what was to prevent them from fitting out fire ships and rocket shoots in the *Sea of Azof* for burning the English transports in a place so favourable for their destruction by fire; and also the French fleets, in the two bays to the westward, offered a fair chance of destruction by a small well handled flotilla of fire ships, manned by resolute and devoted crews, and it is known that when well-officered, the Russians are both resolute and devotees.

The Crimean war had at the time of our arrival been stripped of its "pomp and circumstance." The privations, sufferings, and losses of the army had destroyed all its glitter, and the weariness of a protracted siege had damped its ardour, while to add to all this, there was a want of accord between the chiefs of the two armies, and as in point of numbers we were very inferior to our French allies, we had not the might in the councils of war to carry measures opposed to the French view of things. The Royal Commissioners, sent from England to enquire into the condition of our army, took up their quarters on board the *Dinapore*, and so we heard a little of what was going on, and among other things, that had the English views been adopted after the battle of the Alma, the combined forces would have marched right on to Sebastopol, and so have ended the Crimean war after the first battle. For it was known afterwards that there was nothing to prevent our marching right into the place during the panic of the Russians, after their unexpected and sudden defeat at Alma.

We rarely heard any music but the sound of the bugle, or saw a decent uniform, and I remember on one occasion, when riding out to the Greek Monastery, passing an officer of the Coldstreams who made such a sorry figure on a wretched half-starved horse, that he would

have passed for anything in the world rather than for a guardsman. He was going in search of a feed of grass for his hungry animal, so we rode together, and near to the chapel of the monastery, where we heard the fine bass of the monks chaunting the service, and it was a very strange blending of sounds, their deep rich voices, with the boom of the siege guns thundering heavy shot into the midst of those, for whose safety these monks were praying. Yet such is war, which seems of all irrational things on this sad earth to be one of the most irrational, and what it really is can never be known by hearing and reading about it—its horrors, massacres, and atrocities must be seen, and whoever saw the six hundred slain—English, French, and Russians heaped together in the Redan trenches, or who happened to be in Sebastopol the morning after the retreat of the Russians, and seen the dead lying about all over the town, and in all the hospitals—whoever saw all this and a great deal besides, might well ask, "for *what* is all this slaughter?" No sight struck me more than that of a group of six dead Russian soldiers with their wounds freshly bandaged. In two cases the bandages had not been completed, while a little way off lay the shattered body of the young surgeon with his valise of bandage rolls and coarse lint, and in his left hand a loose bandage red with blood, while his right hand had been shot away. This group was close to a heavy gun, and it seemed that while their wounds were being dressed, a *shell* must have fallen among them and its explosion killed them all—the poor young surgeon also, while busy with his work sharing the fate of the men whose lives he was trying to save. There was hardly a house in the town not riddled with shot, and to give an idea of the immense quantity of these fired into the place—I counted not less than *fifty* lying on the floor of a church not larger than St. Stephen's at Westminster, the bell of this church had been shattered by a shot, and its fragments lay scattered about, and I brought away one of these with the intention of having a small bell cast from it, on which might be engraved a brief sad legend.

During our stay in the Black Sea, we took a cruize to *Kertch* and to *Sinope*. What struck us most at the former place was the wreck of the *Museum*, and at the latter place, the wreck of the Turkish fleet. Both of these tell very sad stories, one the rifling and barbarous destruction of a collection never to be replaced; the other, not of a naval battle, but of a *slaughter* not to be exceeded in inhumanity in the annals of any nation, savage or civilized. W. C. P.

THE discovery of tin, in large quantities, in the Dutch East Indies, has so reduced prices that the Cornwall mines of England can no longer be worked at a profit. Machinery recently put up at a cost of fifty thousand dollars has been sold for four thousand dollars. Seventy-eight mines have been wound up compulsorily, and twenty thousand miners thrown out of employment.

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.*

(Concluded from page 665 last Volume.)

The Haze.—Hazy weather, which is some approach to fog, happily is never so obscure as this. It occurs generally in the season of heat, and with fresh N.E. winds is tolerably frequent on the coast of Galicia and Portugal.

In the Gulf of Cadiz in the summer time, especially with light southerly winds, a thick haze is seen on the horizon, and so much refraction is produced by it that it sometimes acts as a mirror. It changes in a remarkable degree the hulls of vessels and the forms of buildings near the sea, making the projecting points of the land appear as if they were in some way suspended above the water. Such effects of the haze are generally the forerunners of humid and still weather. Sometimes they foretell easterly winds, perhaps with something in them.

In dry winters these parts are subject to thick fogs through which the coast cannot be seen excepting at a very short distance. It is however during the *Vendaval* that wet mists occur, which are worse than fogs; and indeed they prevail over all the coast under consideration. Navigators looking out for their landfalls under such unfavourable circumstances are often much perplexed to know their position, for then they can have no assistance from the features of the interior land. Even near the sea-coast it is so disfigured, that frequently towns and similar buildings have been mistaken for sails of ships; and then if the coast is fringed with outlying reefs of shallow approach, they run the risk of grounding unless some friendly breaker warns them of their danger.

Landfalls.—On these coasts there are three very remarkable points for a landfall, and these are Cape Spartel, Cape St. Vincent, and Cape Villano or Finisterre. The first is always used by vessels bound to the Mediterranean and those coming from America, which run on some parallel southward of lat. 36°, on account of the northerly winds not allowing them to make Cape St. Vincent. The same landfall is made generally by other vessels from the westward, which have had to make northing whether bound to Cadiz or the Mediterranean; and those also from European ports to the northward make Cape Villano, whether they may be bound to any of the estuaries or ports of Galicia and Portugal, or Cadiz, or the Mediterranean.

Vessels bound to the Mediterranean, and running on the parallel of the Strait, should always make Cape Espartel their landfall in preference to Cape Trafalgar. Cape Espartel is high, bold, and conspicuous; Cape Trafalgar is low and surrounded by reefs, and when the vessel's position has not been confirmed by known points of the

land, the landfall which should be adopted ought always be conspicuous and bold, one that may be seen from a great distance also by night, and better if it should have a light, and can be approached without any risk.

Cape Trafalgar may be made by vessels bound to the Mediterranean that have already confirmed their position by seeing Cape St Vincent, Cape St. Mary, etc., and with N.E. winds, because it is then probable that the Levanter will be blowing violently in the Strait; and it is better that they should then keep the Spanish Coast on board.

Cape St. Vincent is generally preferred as a landfall on account of its conspicuous nature, as well as its freedom from rocks, and its projecting outside the line of coast which allows of vessels making it without being hampered by the shore north and south of it. Besides which it is admirably marked by the height of Monchique which can be seen at a great distance. But in time of war it has been avoided as a landfall because it has been infested by privateers and ships of the enemy.

Cape Villano is always preferable as a landfall to Cape Finisterre because it is high and projects out to the N.W., and therefore is always adopted by vessels from the English or St. George's Channels. These indeed generally avoid making Cape Prior that they may keep clear of the currents, and heavy seas and winds common to the N.W. face of the Peninsula. Villano is easy to make, not only on account of its advanced position outside of this coast, but also from its peculiar form. When made from afar it has the appearance of an old castle, the effect of a peak on its summit; and when seen isolated it assumes the appearance of a vessel rigged as a sloop or cutter. It is seen before Cape Tourinana, because it is higher and more remarkable, although it does not project so much.

The Cies Islands and Cape Le Roca.—Vessels from the westward bound to Lisbon or Vigo and confident of their reckoning have the Cies islands and Cape Roca as landfalls, both of which are easily made. Vessels bound to Oporto will have been careful of the shore unless certain of their reckoning, for this port being situated on ground of much sameness and uniformity it is not easy to recognise afar off, when the coast should not only be very clear but its configuration distinct.

All the points we have mentioned, being well suited for a landfall, are happily provided with excellent lights, which enable a vessel to approach them without a risk by night. The light however recently established on Cape Spartel has been the cause of a remarkable mistake. Three vessels coming from the westward made that Cape by night, their commanders being ignorant of a light having been placed there, mistook it for Tarifa, which has also a fixed white light, and they were consequently embayed and lost in Jeremias Bay; no doubt considering that bay to be the mouth of the Strait: two of these were English and one French. The light was established on the 15th of October, 1864. It would be desirable that some modification should be introduced into this light of Cape Spartel so that it could never be mistaken for that of Tarifa. It should not be forgotten that this light being

situated in an uncivilized country might be neglected to be lighted on some night (as will be remembered), and the navigator who under similar circumstances might make Cape Espartel, without seeing the light, might run into the same fatal error.

Making Cadiz.—A ship bound to Cadiz from America unable to make Cape St. Vincent, if her reckoning be good, might make the land somewhere of the bay. The elevated heights of San Cristoval and Ubrique, visible from a great distance in clear weather, are excellent marks for it. San Cristoval, known to navigators under the name of *Cabeza del Moro*, is 1755 metres (5758 feet) high, and may be seen from a vessel twenty-five to thirty miles from the bay. Neither of these heights can possibly be mistaken for any other, because they only are to be then seen above the horizon.

Coming from the Canaries a vessel may look out for Cadiz if her reckoning be good and she has favourable winds; but if these be to the southward of east, and an easterly wind be observed in the Strait, she ought to make for Cape Spartel, and get a fresh departure so as to make sure of Cadiz Bay. And should this be at night the lights of Cape Espartel and Trafalgar will be still more certain means of giving her her position and the proper course to be steered.

Making Cadiz in Hazy Weather.—It might happen that a vessel has hazy weather for making Cadiz, and yet she might clearly see the height of Beba and that of San Lucar not far from it. The first is a hill of gentle slope rising above the adjacent land, and is distinguished by a white house called Beba or Breba, situated three miles S. 62° E. of Chipiona, and is seen from the whole neighbourhood of Cadiz. A vessel situated a little north of its parallel would soon make out the ex-convent of Ragla, the town of Chipiona, and other buildings on the coast, the whiteness of which would render them visible in spite of the haze, should there be any.

If the hill should be so enveloped in haze that neither the small heights nor the buildings of the coast can be seen, the colour of the water near the shore will indicate its proximity to the seaman, and the lead will soon verify his position. At a distance of four to five leagues from Cadiz when from W.S.W. to S. of it he knows the soundings are clear sand, and if it be loose blackish clay he will be on the parallel of the bay.

NAVIGATION.—Vessels from the Strait of Gibraltar bound to Cadiz should keep the Spanish coast in hand, and may pass inside of the Aceitera rock, and even the Conil reefs if she have on board a pilot for their channels, and the vessel should be of the proper draft. The steamers which trade along the coast, can, and do adopt this navigation, for without losing any distance they are sheltered from the wind which about here blows with considerable violence.

The navigator, however, who has not sufficient experience should keep outside of all these dangers, especially if his vessel is large and has only sail. In such case it will be sufficient to keep at four miles from the coast, and bringing Cadiz light to be N. by E., should steer to the northward so that she should have the tower on her starboard hand,

and pass as near as safe to the reefs off point San Sebastian, so as to avail herself all she can of the wind on first standing into the bay.

Making Cadiz in an East Wind.—Should the tide not answer, or if it be evident that on gaining San Sebastian point, the ebb will have made, (which is a point that should be studied beforehand,) the navigator must be contented to stand off and on between Cadiz and Cape Roche, where the wind will not be so strong as in the entrance of the bay, and as soon as he has reason to believe that the tide is making at Cadiz, he may run for the entrance of the bay with the view of taking the harbour.

He should endeavour always so to manage his boards as to be at the entrance of the channel by the time that the flood has gained its greatest strength, with the view of making the least possible number of boards. It would not be prudent to beat in against a headwind on an ebb tide unless at neaps, and even then not unless the vessel be a fast sailer.

If, on making Cape Trafalgar there is much ground sea, a vessel should not attempt to pass inside of the Aceitera and other dangers, she should rather increase her distance to five miles from the coast, as much for avoiding the streams of current off the Cape, as for keeping in depths of 15 to 18 fathoms: and when she has gained the meridian of Cadiz light she should steer so as to keep in depths in which the sea will not break, and edge as near as she can with safety to the reefs of San Sebastian, so as to gain all she can on her first reach into the bay.

Precautions on passing inside the Conil rocks. A vessel after having adopted the passage inside the reefs might desire to get outside of them, which she might do by passing between the Meca and Conil reefs, or between these and Cape Roche, taking care to determine her position well by good cross marks, so as to be able to select the proper course to take her mid-channel; and her captain bearing in mind that the flood tide *always sets to the N.W.*

If the ground swell is very heavy it will break on nearly all the rocks, and will run high in the channels, and therefore in such a case the navigator must not think of adopting the inner route.

When bound to Cadiz from the strait, and the ship is on the meridian of Cape Plata, the easterly wind will slacken and it may be observed that the westerly wind is blowing at sea. The vessel must then keep on a southern parallel so as to be able to pass from ten to twelve miles from Cape Trafalgar, with the view that, when the *westerly* wind reaches her she may be able to stand on to the entrance of the bay.

Precautions in passing the Strait when bound to Cadiz. In winter time the same precaution must be observed coming from the Strait, but from another motive; since it frequently happens that, while there is a fresh easterly wind in the mouth of the Strait, the Vendaval will be prevailing to the westward. Hence the navigator on gaining the meridian of Tarifa finding the easterly wind veering to the south-east should keep towards the African shore; for he may be sure that

as he reaches Cape Spartel, the wind will draw to the southward and get steady at south-west: then being well clear of the Spanish coast, he will easily clear all the reefs and run free for Cadiz bay.

Precautions for San Lucar or Huelva. The same course should be observed and the same precaution followed by vessels bound to San Lucar or Huelva: that is, with easterly wind prevailing, they should keep in hand the Spanish coast whether they pass inside or outside of the shoals or reefs.

From Cadiz to the Strait in the Easterly wind. Vessels from Cadiz or any of the western ports bound to the Strait with an easterly wind, should hug the shore as much as possible; in doing which they will find shelter from the sea. Thus they may easily get as far as Cape de Plata from which they might stand out and work to the eastward in the middle of it should there not be much sea. By this means they will profit by all the currents setting them to windward.

If on arriving off Cape Trafalgar there is observed to be too much wind in the Strait to admit of their working against it, it will be better to cross the entrance of it with the wind free, and seek refuge under Cape Espartel. It is of no consequence anchoring five or six miles to leeward of this Cape, as it soon can be made up; for when the vessel is sheltered from the sea, and Jeremias bay might be gained, there a vessel may wait until the easterly wind is blown over.

From Cadiz to the Strait in the Westerly wind. From Cadiz or ports west of it, there is no difficulty in getting to the Strait with a westerly wind. As westerly winds are favourable for crossing it, it is sufficient as soon as a vessel is clear of the reefs of San Sebastian, if on leaving Cadiz she runs to the southward until she finds herself S.W. of Conil, and then lays her head S.E. for the middle of it.

If there should be much ground sea, on leaving Cadiz she might steer S. by W. or S.S.W., so as to pass clear of the shoals on the coast, and afterwards lay her head south, S.S.E., and in proportion as she draws into the Strait.

By night. Which ever navigation is adopted by night the lights of San Sebastian, Trafalgar, and Espartel will give the navigator his position so well as to enable him to shape his proper course. In fact, the navigation of the Strait by night may be made with the utmost facility. Cross bearings of the lights of Point Europa and Acho, of Ceuta and Tarifa, and this with those of Espartel and Trafalgar, and again this coast with that of Cadiz will always give the navigator his position, and with these he may navigate from the Strait to Cadiz, and *vice versa*. The character of the lights on the coast of Spain are so arranged that they cannot be mistaken for each other, and their particulars are to be found in the usual books.

If a vessel for Cadiz be coming from the westward, and she encounters a strong Levanter off Cape St. Mary, she should work to windward between the parallel of Cadiz and the coast of Huelva, so as to avoid the strong wind in the parallel of the Strait, as well as the sea which it raises; and she had better keep to the coast from the moment she can lay up for the Broa de San Lucar.

Coasting vessels working from Agnamonte or Huelva to Cadiz, and from Cadiz to the Strait, often anchor when they find themselves met by the easterly wind. They will lie at anchor off some beach during the height of the wind, and avail themselves of the nights when besides not being so strong, the wind becomes more N.E. The ebb tide should be profited by as much as possible, for at Springs it helps a vessel to windward very much.

From Cadiz with the Vendaval. The greatest difficulty a vessel has to overcome, whether from the westward or from the Strait, is when she has to deal with a Vendaval in rainy wet weather, which prevents anything from being seen of land or sea. If the commander should not have previously obtained his position and thus be ready with the course he will run into the bay with, it would be better for him to haul out than to get entangled with the coast, and keep, if he can, on the parallel of the Strait in order that in case of mischief he can run for it.

If he be caught by it on the meridian of Huelva or Agnamonte, he should endeavour to wait under all possible sail to make up for the current, which along with the tide will set his vessel into the gulf of Huelva and he should make her boards so as will keep her best from this danger until the weather clears and will enable him to make the land to obtain afresh her position.

As the coast in the vicinity of Cadiz and the whole circuit of the gulf of Huelva is low, it cannot be seen from a vessel until she be close to it. In this case she may have recourse to the lead, and determine her distance from it by the depth of water and the character of the bottom. The depth of a hundred fathoms off Cadiz and the gulf of Huelva is more than twenty miles from the shore.

Navigation from the Strait with a S.W. wind. On crossing from the Strait to Cadiz with a fresh S.W. wind, a vessel must be careful to make such courses as will free her from the effect of the current, which will drift her towards Conil and Santipetri. Similar precaution should be taken by those which are for making Cape St. Vincent with the same wind and weather, to avoid being set down towards San Lucar and Huelva, and also those again which are taking the opposite direction.

The steam packets which frequent the coast know from experience that it is essential to keep well clear of the coast on crossing the Gulf of Cadiz, when blowing strong from seaward, so as to avoid being set down towards it, whether off Cape St. Mary, the Arenas Gordas, Chipiona, or the Conil reefs. With foul winds or even those from north to east on the contrary they close with the shore, for the currents *then* set them from it.

Navigation from the Strait to the Portuguese and Galicia coast. Vessels from Cadiz or the Strait of Gibraltar bound to the coast of Portugal or Galicia will make their passages as we have already shewn in each particular case, making for Cape St. Vincent with the view of doubling it at a convenient distance. And this Cape being clear may be approached as near as they please.

If vessels near it with a fresh S.W. breeze they should give it a good berth so as to pass it well free, and if bound to Vigo, the Bay of Biscay, or the Channel, they should take care to make a more westerly course than required by the trend of the coast, because the current produced by this wind sets a vessel towards the shore. It must also be remembered that the Vendaval obscures the daylight, and a vessel may find herself aground when she is considered clear of all danger.

Should the vessel be bound to Lisbon, Capes Espartel and La Roca will be seen during the day, and their lights at night to show the position of the Estuary: but if she be destined for Oporto and a Vendaval with dismal blowing weather prevails, it would not be prudent to close with the coast; for this being very rocky near it, and the heights of the interior difficult to make out, a vessel will be at a loss to make sure she is on the parallel on which she can approach the Douro.

For the coast of Galicia with a Vendaval. Should the vessel be bound to Vigo or any other Estuary she may stand along the coast between the mouth of the Mino and Cape Silliéro, taking care with such weather not to overrun her distance; for the currents will set the vessel to the northward, and how much, it will be difficult to determine. Having made the Cies islets, which are high and remarkable, she may take Vigo inlet or continue for her port if it be north of them.

Vessels bound to Corunna or Ferrol in a Vendaval must also take care not to overrun their distance, for they will find a difficulty in recovering it to windward. When the S.W. wind is attended with very thick weather the coast of Galicia is completely obscured, and it is necessary to see much of it to make it out. With such a destination she should make Capes Finisterre, Tourinana, or Villano, and keeping the coast in hand run along it at a convenient distance, not to lose sight of it for the port of destination. After doubling Cape Villano the wind will be more favourable.

If a vessel considering herself off Cape Finisterre should find the coast so obscured that she cannot make sure of it, it will be most prudent to stand off and on, keeping sufficient sail on her to prevent falling to leeward, and waiting till the weather clears so that she can make the coast satisfactorily. Cases are known, when the breakers on the reefs have been close to a vessel from which the trend of the coast could not be seen, nor headlands or lights by night. In such cases doubt must prevail, and the best plan is always to stand off and wait for clearer weather.

Navigating from north to south on the coast of Galicia and Portugal. The reverse navigation, that is from north to south may be made with the utmost freedom from anxiety, because being the season of the Northers a vessel has but to run along the coast. But it is not so in Winter time and with the Vendaval, for she has then a head-wind, dirty weather, a heavy sea, and contrary current. On the coast of Galicia she may have recourse to any one of its open and safe estuaries; but on that of Portugal she can only reckon on a very few ports and all of them with bars.

A vessel running from north to south on their coasts with a fresh N.W. wind must be very careful of her course. With this wind which is on shore, she must take care to keep to the westward of the course required by the line of coast, for the vessel will be drifted towards the shore. Fortunately those N.W. winds are not so much attended with dirty weather as those from S.W., and although they bring heavy showers with much wind, these are always followed by clear intervals which allow of the coast being seen, and the vessel may recognise her position from time to time.

Navigating from S. to N. on the coast of Portugal and Galicia. The most troublesome navigation on the coasts of Portugal and Galicia is that from south to north, in the season of the north-easters, and these generally prevail with but slight interruptions all the Summer, and especially in those years which navigators have called the *years of Northers*. Even in the passage from Cape St. Vincent to the Estuary of Ferrol, there are many instances in which vessels have been from one to two months in making it.

When northerly winds prevail and which will vary between N.N.E. and N.N.W., the navigator in an ordinary bad sailing square rigged vessel has a trying task of it. Powerful vessels at once stand off the coast a long distance so as to avoid the strength of the current, which is always heaviest in shore and succeed in getting a slant of wind from N.W. with which they make very fairly to the N.E.; but small craft and coasters find themselves obliged to consume their provisions under the lee of some cape or point, avoiding the regular ports, so as not to increase their expenses by duties.

Should the vessel which is making her passage under such circumstances be fast and her commander acquainted with the coast, he can profit by these unfavourable conditions. To effect this he will avail himself of every slight alteration in the wind, taking care to be near the coast at nightfall when it comes from N.E., and stand out at daylight so as to tack in shore about noon and again get hold of the coast. If with this he can manage to combine the favourable set of the tide, he will forward his voyage far better than those navigators who from fear of the shore keep it at a great distance without profiting by the changes favourable to them, either in shore or out on the offing.

When the northerly winds bring much sea the voyage is necessarily delayed, for this completes a combination of opposing conditions for the navigator, and obliges him to remain for days and perhaps weeks under the shelter of Cape St. Vincent, at Setuval, Cascaes, Peniche, etc., and it is seldom that the coasting craft escape without having recourse to all those anchorages.

Steamers, which are vessels that go lording it over the sea, make their passages along the coast either way. They keep off the coast to seaward, but making it for the sake of their position always pass inside the Berlings, either by day or night, unless indeed the weather is so obscure that they have no chance of seeing them.

It must be observed that the foregoing directions which we have given for the coasts under our consideration, in reference to the winds and currents which prevail on them, must not be looked on as perfect: they are the result of the observations of seamen who have often frequented them and know them well, but cannot be expected to provide remedies for all emergencies.

Every year, every season, even every day, peculiarities may be observed in the relation of winds and currents on these coasts, that lead us to doubt sometimes whether sufficient data has been collected for those who have endeavoured to describe them for the benefit of navigators. It is quite beyond our conception to account for, why in the years of prevailing east winds, these winds do prevail more persistently than in any others; and why in years of westerly winds, northerly winds, etc., these will prevail over the rest.

Experience teaches us that there are huge anomalies in atmospheric and oceanic circulation without our being able to give the reasons which produce them. Our duty therefore is to collect and present to seamen tables of meteorological observations accompanied by some reflections in order that those may use them who frequent our shores.

Meteorology yet in its infancy can do little; but thanks to its cultivation in a multitude of observatories, it has commenced its progress from such information collected from all parts of the world where human wisdom has penetrated; and it may be presumed that in a few years we shall be able to gather some fruits from all those able minds, incessantly labouring with the phenomena which we so frequently admire in the great celestial vault.

Meanwhile England has established with some effect centres of meteorological observation, with the view of foretelling the weather which may take place in certain localities in the course of twenty-four hours or so, with the assistance of one of the most powerful auxiliaries yet invented, the electric telegraph. We allude to the Forecastes of Weather published by the Meteorological Department of the Board of Trade, circulated throughout Great Britain for the information of shipping and especially those proceeding to sea.

A similar centre of observation has been established at Paris, although hitherto (July, 1866) not with the result hoped for, possibly from so much extent of continent intervening between it and the sea, perhaps causing a change in the stormy weather in its progress so far inland as to interfere with the forecastings. This does not apply to the United Kingdom which is more dispersed and occupies a better position for such kind of observation.

July, 1866. P. Riudavets Y Tudure.

The foregoing concludes our translation of Senor Tudure's elaborate paper on the Strait of Gibraltar and the adjacent coast, one that cannot fail to prove of service to the navigator. Having thus dealt with the Ocean side of the Strait, in a future number we may probably call the seaman's attention to its Mediterranean side.

A Leaf from the Abyssinian Tributaries to the Nile.

*By Sir Samuel Baker, F.R.G.S.**

A work has just been issued from the press that has not been surpassed in adventure and interest for a long time. As we said in our last, the lovers of the chase will revel in it. But as we were then from want of space obliged to lay it aside, we will now present our readers with some account of it,—merely premising that the work in question relates Sir Samuel Baker's doings among the Nile tributaries of Abyssinia.

The Nile in its annual flooding of Lower Egypt appears to have been always a puzzle to geographers. It had its own legitimate sources which were situated far away in the equatorial regions of Africa, and which, with the abundance of rains they were regularly receiving, kept up their supply to the river. But there was more than this. There came more occasionally than the river could discharge,—a rush of water which not only formed its delta, but overwhelmed it, and rendered necessary those marks by which on its subsidence landed property was recognised. In his preface to the work before us, Sir Samuel Baker tells us the inundation, which by its annual deposit of mud has actually created the Delta of Lower Egypt, upon which the fertility of Egypt depends, has an origin entirely separate from the lake-sources of Central Africa, and this supply of water is derived exclusively from Abyssinia.

"The two grand affluents of Abyssinia are the Blue Nile and the Atbara, which join the main stream respectively in lat. N. 15° 38′. These rivers, although streams of extreme grandeur during the period of the Abyssinian rains—from the middle of June until September, are reduced during the dry months to utter insignificance; the Blue Nile becoming so shallow as to be unnavigable, and the Atbara perfectly dry. At that time, the water supply of Abyssinia having ceased, Egypt depends solely upon the equatorial lakes and the affluents of the White Nile until the rainy season shall again have flooded the two great Abyssinian arteries. That flood occurs about the 20th of June, and the grand rush of water pouring down the Blue Nile and the Atbara into the parent channel inundates Lower Egypt and is the cause of its extreme fertility. Not only is the inundation the effect of the Abyssinian rains, but the deposit of mud that has formed the delta, and which is annually precipitated by the rising waters, is also due to the Abyssinian streams; more especially to the river Atbara, which, known as the Bahr el Aswat (Black River), carries a larger proportion of soil than any other tributary of the Nile: therefore, to the Atbara above all other rivers must the wealth and fertility Egypt be attributed."

Here then, concisely it may be stated, "The equatorial lakes *feed*

*See page 631 last Volume.

Egypt, but the Abyssinian rivers *cause* the inundation." Such, in a few words (those of Sir Samuel Baker), is the whole secret of the Nile.

Previous to the discovery it was a question whether the sources of the great river were not in the Abyssinian mountains, notwithstanding there were certain lakes laid down as that cause by the ancient geographer Ptolemy, and the explanation of Sir Samuel Baker confirms the lakes as the source of the river, and the Abyssinian tributaries as the cause of its overflow and formation of the delta. Yet the Nile is not formed by the Abyssinian rivers, for their contribution is only temporary, being violently filled for about three months, and the rest of the year entirely dry, saving here and there a pool where the bed is deeper. The normal condition of the Nile is due to its stream from the equatorial lakes, and its channel is sufficient for them, but not so for the violent Abyssinian streams, and hence the overflow which really comes from the Abyssinian rainfall. This rainfall joins the Nile at about the middle of its course through the Blue Nile and principally by the Atbara, a magnificent stream when filled, and which brings along with it so much silt as to obtain for it its name, which signifies Black. It is this silt which after accumulating for centuries has formed the Delta of the Nile—the fertile plains of Egypt.

It was the main object of Sir Samuel Baker to explore the distant sources of the Nile, but as another object was also to trace the Nile tributaries of Abyssinia, and as these lay in his way, he directed his steps first towards these, and leaving Cairo, following the main course of the river, he opens his interesting journal at Korosko, where, to cut off a large bend of the river, he commenced his travel across the Desert to Abou Hamed, and Berber.

The navigation of the Nile at this season of the year (end of May) was most difficult and scarcely possible owing to the water being so low, but his journey from Korosko to Berber occupied him fifteen days; and here, when the ex-Governor heard of the object he had in view, he marvelled, and said, "Don't go upon so absurd an errand! Nobody knows anything about the Nile; neither will any one discover its source." A beautiful picture this of Eastern indifference! Here were the representatives of the Egyptian Government displaying themselves in their true colours. They did not know the source of the Atbara, how should they know the source of the Nile? And not only this, but they desire to dissuade our countryman from his "absurd errand!" However, his kindness and attention to our traveller was all that could be desired. A week's rest in the garden of Hallem Effendi, prepared the party for their journey, and notwithstanding the advice of the old Effendi, Sir Samuel Baker determined on exploring the Atbara previous to carrying his observations up the White Nile. The Nile itself, he tells us, was hourly rising, its own rains having commenced (June); but not so with the Atbara, for leaving the town of Berber, and journeying about twenty-five miles along its bank, the junction of the Atbara with it was gained; that is, the bed of the latter, for the river was then not flowing. There was a steep bank, on descending which for about twenty-five feet, a broad

surface of white sand was found, which then formed the dry bed of the river. It was about 400 yards across, and an encampment was formed on the further side of it for the night. Starting at daylight the next morning, the route lay along the margin of the river's dry bed, due east, through a sandy copse of thorny mimosas which fringed it, to about a quarter of a mile broad on either side, beyond which all was the Desert.

A good idea may be formed of the curious nature of the Abyssinian rivers by this principal one, the Atbara. It had a curious appearance, we are told. In no part was it less than 400 yards in width, while in many places this was much exceeded. The banks were from 25 to 30 feet deep: they had evidently been overflowed during floods, but at that time the river was dead. Not only partially dry, but so glaring was the sandy bed that the reflection of the sun was almost unbearable; and the trees and bushes being entirely leafless from the intense heat as trees in England during winter. But a pool of water here and there in a deep bend of the dried river was an inviting attraction in the great heat to which the party were exposed.

These pools, it appears, occur now and then in the sudden bends of the river, and are hollowed out by the sheer strength of the stream, sometimes to a depth of 20 or 30 feet below the bed of the river. In fact, they are so many huge holes, and are reservoirs of water when the river itself is exhausted, forming asylums where the inhabitants of the river crowd together for sustenance, which they can find no where else. Here we see the hand of the Creator in the midst of the arid burning Desert providing relief from that destruction to them which would otherwise follow from the loss of the river. It reminds us of the lines of some one who has said—

> "Nature, all her children viewing,
> Kindly bounteous cares for all."

Varying from a few hundred yards to a mile in length at these seasons of dryness, we are told that "they are positively full of life; huge fish, crocodiles of immense size, turtles, and occasionally hippopotami consort together in close and *unwished* for proximity. The animals of the Desert,—gazelles, hyenas, and wild asses are compelled to resort to these crowded drinking places, occupied by the flocks of the Arabs equally with the timid beasts of the chase. The birds that during the cooler months would wander free throughout the country are now collected in vast numbers along the margin of the exhausted river; innumerable doves, varying in species, throng the trees and seek the shade of the dome palms (which only now have shade); thousands of Desert grouse arrive morning and evening to drink and to depart; while birds in multitudes, of lovely plumage, escape from the burning Desert, and colonize the poor but welcome bushes that fringe the Atbara river."

We have now a tribute to the mighty Nile the majesty of which over even such tributaries as the Atbara is thus acknowledged. "The heat was intense. As we travelled along the margin of the Atbara and felt with the suffering animals the exhaustion of the climate, I acknow-

ledged the grandeur of the Nile that could overcome the absorption of such thirsty sands and the evaporation caused by the burning sands of Nubia. For nearly 1200 miles from the junction of the Atbara with the parent stream to the Mediterranean not one streamlet joins the mysterious river, neither one drop of rain ruffles its waters, unless a rare thunder-shower, as a curious phenomenon, startles the Arabs as they travel along the Desert. Nevertheless the Nile overcomes its enemies, while the Atbara shrinks to a skeleton, bare and exhausted, reduced to a few pools that lie like blotches along the broad surface of the glowing sand."

Yet even the Desert has its advantages by the side of these oases, few as they are. Water is at hand and need not be carried far. At length about seven days' march from the Nile, or 160 miles from it, at a peculiar bend of the Atbara, a well-known halting place is reached by our party, known to the Arabs as Colladabad. The monotony of a small strip of vegetation along the banks with no other game but geese, pigeons, gazelles, and desert grouse, was at length to be varied by some change of a more exciting kind, for here our party were to be introduced to the great hippopotamus. We will venture to say that this formidable animal never met with a more venturesome, or to him a more fatal sportsman, than our traveller Sir Samuel Baker. The tents were pitched on the bank of the Atbara at Colladabad, among a group of Arabs of the Bishareen tribe. Here too a bull hippopotamus had been dominant; bullying the occupants of the pool and out of it too, that interfered with his proceedings. We can imagine the anxiety of Sir Samuel to get a sight of this gentleman, and try his maiden shot in Africa, just to see if he could do as much in the Desert as he had done in India. Here is his own account of his proceedings.

Birds were plentiful, but early in the morning, he says, I procured an Arab guide to search for the reported hippopotami. My tents were among a grove of dome palms on the margin of the river. Thus I had a clear view of the bed for a distance of about half a mile on either side. This portion of the Atbara was about 500 yards in width, the banks were about thirty feet perpendicular depth; and the bend of the river had caused the formation of the deep hollow on the opposite side, which now formed the pool, while every other part was dry. This pool occupied about one-third the breadth of the river, bounded by the land on one side, and by a perpendicular cliff on the other, upon which grew a fringe of green bushes similar to willows. These were the only succulent leaves I had seen since I left Berber.

We descended the steep sandy bank in a spot that the Arabs had broken down to reach the water, and after trudging across about 400 yards of deep sand, we reached the extreme and narrowest end of the pool. Here for the first time I saw the peculiar four-toed print of the hippopotamus's foot. A bed of melons had been planted here by the Arabs in the moist sand near the water, but the fruit had been entirely robbed by the hippopotami. A melon is exactly adapted for the mouth of this animal as he could crunch the largest at one squeeze, and revel in the juice. Not contented with the simple fruits of the garden,

a large bull hippopotamus had recently killed the proprietor. The Arab had wished to drive it from his plantation, but was immediately attacked by the hippopotamus, who caught him in his mouth and killed him by one crunch. This little incident had rendered the hippopotamus exceedingly daring, and it had on several occasions charged out of the water when the people had driven their goats to drink. Therefore it would be more satisfactory to obtain a shot and to supply the hungry Arabs with meat at the expense of their enemy.

At this early hour no one had descended to the pool, thus all the tracks on the margin were fresh and undisturbed. There were the huge marks of crocodiles that had recently returned to the water, while many of great size were still lying upon the sand in the distance. These slowly crept into the pool as we approached. The Arabs had dug small holes in the sand within a few yards of the water. These were the artificial drinking places for the goats and the sheep that would have been snapped up by the crocodiles had they ventured to drink in the pool of crowded monsters. I walked for about a mile and a half along the sand without seeing a sign of hippopotami except their numerous tracks upon the margin. There was no wind and the surface of the water was unruffled; thus I could see every creature that rose in the pool either to breathe or to bask in the morning sunshine.

The number and size of the fish, turtles, and crocodiles were extraordinary; many beautiful gazelles approached for their morning draught, wild geese, generally in pairs, disturbed the wary crocodiles by their cry of alarm as we drew near, and the desert grouse in flocks of many thousands had gathered together and were circling in rapid flight above the water, wishing but afraid to descend and drink. Having a short gun with me I fired and killed six at one discharge, but one of the wounded birds having fallen into the water at the distance of about 120 yards, it was immediately seized by a white throated fish eagle, which perched upon a tree, swooped down upon the bird utterly disregarding the report of the gun. The Bishareen Arabs having no firearms thus the sound of a gun was unknown to the game of the desert.

I had killed several wild geese for breakfast in the absence of the hippopotami, when I suddenly heard the loud snorting neigh of the animals in my rear. We had passed them unperceived as they had been beneath the surface. After a quick walk of about half a mile during which the cry of the hippopotami had been several times repeated, I observed six of these curious animals standing in the water about shoulder deep. There was no cover therefore I could only advance on the sand without a chance of stalking them. This caused them to retreat to deeper water, but on my arrival within about 80 yards, they raised their heads well up, and snorted an impudent challenge.

I had my old Ceylon No. 10 double rifle, and taking a steady aim at the temple of one that appeared to be the largest, the ball cracked loudly upon the skull. Never had there been such a commotion in the pool as now. At the report of the rifle five heads sank and dis-

appeared like stones, but the sixth hippopotamus leaped half out of the water and falling backwards commenced a series of violent struggles; now upon its back, then upon one side with all fonr legs frantically paddling, and raising a cloud of spray and foam, then waltzing round and round with its huge jaws wide open, raising a swell in the hitherto calm surface of the water. A quick shot with the left hand barrel produced no effect, as the movements of the animal were too rapid to allow a steady aim at the forehead. I accordingly took my trusty little Fletcher* double rifle, No. 24, and running knee-deep into the water to obtain a close shot, I fired exactly between the eyes near the crown of the head. At the report of the little Fletcher the hippopotamus disappeared. The tiny waves raised by the commotion broke upon the sand, but the game was gone.

This being my first *vis a vis* with the hippopotamus I was not certain whether I could claim the victory. He was gone, but where? However, while I was speculating on the case I heard a tremendous rush of water, and I saw five hippopotami tearing along in full trot through a portion of the pool that was not deep enough to cover them above the shoulder. This was the affair of about half a minute, as they quickly reached deep water, aud disappeared at about 150 yards distance.

The fact of five hippopotami in retreat after I had counted six at the onset was conclusive that my waltzing friend was disabled. I accordingly lost no time in following the direction taken by the herd. Hardly had I arrived at the spot where they had disappeared when first one and then another head popped up and again sank, until one more hardy than the rest ventured to appear within fifty yards, and to bellow as before. Once more the No. 10 crashed through his head, and again the waltzing and struggling commenced like the paddling of a steamer. This time however the stunned hippopotamus in his convulsive efforts came so close to the shore that I killed it directly with a forehead shot with the little Fletcher. I concluded from this result that my first hippopotamus must be lying dead in deep water.

Now for the effects of this kind of treatment to which these animals had not been accustomed, and we may be allowed to doubt whether any one of our first-rate home sportsmen would have been so successful with his *vis a vis* with these formidable gentry.

The Arabs having heard the shots fired, we are told, had begun to gather towards the spot, and on my men shouting that a hippopotamus was killed, crowds came running to the place with their knives and ropes, while others returned to the encampment to fetch camels and mat-bags to convey the flesh. In half an hour, at least three hundred Arabs were on the spot. The hippopotamus had been hauled to the shore by ropes, and by the united efforts of the crowd, the heavy carcase had been rolled to the edge of the water. Here the attack

* This excellent and handy rifle was made by Thomas Fletcher, of Gloucester, and accompanied me like a faithful dog throughout my journey of nearly five years to the Albert Nyanza and returned with me to England as good as new.

commenced. No pack of hungry hyenas could have been more savage. I gave them permission to take the flesh, and in an instant a hundred knives were at work. They fought over the spoil like wolves. No sooner was the carcase flayed than the struggle commenced for the meat. The people were a mass of blood, as some stood thigh deep in the reeking intestines wrestling for the fat; while many hacked at each other's hands for coveted portions that were striven for as *bonne bouche*. I left the savage crowd in their ferocious enjoyment of flesh and blood, and I returned to camp for breakfast, my Turk Hassen Ashmet carrying some hippopotamus steaks.

That morning my wife and I breakfasted on our first hippopotamus, an animal that was destined to be our general food throughout our journey among the Abyssinian tributaries of the Nile. After breakfast we strolled down to the pool to search for hippopotamus No. 1. This was at once found dead, as it had risen to the surface and was floating like the back of a turtle a few inches above the water. The Arabs had been so intent on the division of their spoil that they had not observed their new prize. Accordingly on the signal being given a general rush took place, and in half an hour a similar scene was enacted to that of hippopotamus No. 2. The entire Arab camp was in commotion and full of joy at this unlooked for arrival of flesh. Camels laden with meat and hide toiled along the sandy bed of the river. The women raised their long and shrill cry of delight; and we were looked on as general benefactors for having brought them a supply of good food at this season of distress.

And more also we might take the liberty of adding, our sportsman had rid the pool of the frightful bullying hippopotami, possibly one of them the very same which had made a meal of the Arab who had owned the melon garden. They were not accustomed to such work. and our traveller and his fair companion left an impression of the stuff his countrymen are made of, an impression which there is little doubt spread fast through the country as a kind of warning that they are not to be trifled with.

The foregoing scene at the chief pool of the Atbara river is a good specimen of the style in which the work before us is made up. But that we knew that the mission of our traveller was to find out what became of these Abyssinian rivers,—to ascertain what kind of tributaries they were or were not to the Nile, his book is replete with dashing exploits of hunting hippopotami, elephants, lions, crocodiles, in fact every wild animal that came in his way. Sir Samuel Baker is the very personification of a first-rate hunter: nothing comes amiss to him on land or water; for with rod and line he is no less successful than with his deadly rifle! How can we look for matters of geographical science from him. We have not seen an astronomical observation, from which we might almost doubt whether he had with him a single astronomical instrument, for certainly herein we find no single trait of one, albeit there may be in equatorial lake explorations. Still his book is most interesting, and our readers who love to dwell on marvellous feats in the presence of those animals which roam at large over the

wilds of Abyssinia to which we have alluded, with abundance of startling anecdotes, will find them in the work before us.

Here is another kind of game which employed the sporting skill of our travellers. Under cover of a camel led by an Arab our sportsman manages to approach within a hundred yards of the beautiful gazelle. A buck gazelle weighs from sixty to seventy pounds and is the perfection of muscular development. No person we are told who has seen the gazelle in confinement in a temperate climate can form an idea of the beauty of the animal in its native desert. Born in the scorching sun, nursed on the burning sand of the treeless and shadowless wilderness, the gazelle is among the antelope tribe as the Arab horse is among its brethren, the high-bred and superlative beauty of the race. The skin is as sleek as satin, of a colour difficult to describe, as it varies between the lightest mauve and a yellowish brown. The belly is snow white; the legs from the knees downwards are also white, and are as fine as if carved from ivory. The hoof is beautifully shaped and tapered to a point. The head of the buck is ornamented by gracefully curved annulated horns, perfectly black and generally from nine to twelve inches long in the bend. The eye is the well-known perfection, the full, large, soft, and jet black eye of the gazelle. Although the desert appears incapable of supporting animal life, there are in the undulating surface numerous shallow sandy ravines in which are tufts of a herbage so coarse that as a source of nourishment it would be valueless to a domestic animal: nevertheless upon this dry and wiry substance the delicate gazelles subsist, and although they never fatten they are exceedingly fleshy and in excellent condition. Entirely free from fat, and nevertheless a mass of muscle and sinew, the gazelle is the fastest of the animal tribe. Proud of its strength and confident of its agility it will generally bound perpendicularly from the ground four or five feet several times before it starts at full speed as if to test the quality of its sinews before the race. The Arabs course them with greyhounds, and sometimes they are caught by running several dogs at the same time. But this result is from the folly of the gazelle who at first distances its pursuers like the wind, but secure in its speed it halts and faces the dogs, exhausting itself by bounding exultingly in the air. In the meantime the greyhounds are closing up and diminishing the chance of escape. As a rule, notwithstanding this absurdity of the gazelle, it has the best of the race, and the greyhounds return crestfallen and beaten. Altogether it is the most beautiful specimen of game that exists: far too lovely and harmless to be hunted and killed for the mere love of sport. But when dinner depends on the rifle, beauty is no protection. Accordingly throughout our desert march we lived on gazelles, and I am sorry to confess that I became very expert at stalking these wary little animals. The flesh although tolerably good has a slight flavour of musk: this is not peculiar to the gazelle, as the odour is common to most of the small varieties of antelopes.

But we must now lay by this interesting volume, having apprised our readers of the treat they will have in its perusal.

The Royal National Life-boat Institution.

The Recent Storms.

Of all the stormy periods which have found noble work for our life-boat fleet, and which have tried the mettle of the brave fellows by whom it is manned, perhaps none have exceeded in violence and destructiveness that of the last few weeks. It has almost seemed as if the tornadoes or cyclones of the Tropics had found their way to our northern shores, although somewhat shorn of their strength before they have reached us. Indeed, if we contrast the character of the short, fitful, and varying storms of the last few years with the steadier and longer gales to which we had been formerly accustomed, it seems more than probable that such has been the case, and that a more general disturbance of the atmosphere in the northern hemisphere has been the result, which disturbance with its consequent unsettled weather and diversified seasons may possibly last for several years to come.

Whether, however, such be the case, and whether the old seasons that we recollect "in the merry days when we were young" will again revisit us, or whether, as is perhaps more likely, the *progressive* changes which have in times past altered the relative climate of the globe, and left the remains of tropical animals and plants even in its present Antarctic regions, will still go on and conduct the earth and its inhabitants through a progression of further changes, so great as to be now inconceivable to us; whether such be the case or not, of one thing we may be certain—that not only will storms and hurricanes continue, but, that they are an essential element in preserving and promoting the purity of the lower stratum of the air, and in thus maintaining it in a fitting state for healthy respiration by the animal and vegetable world.

It behoves us then, even while the dire effects of the storm are spread before our eyes in the shape of broken ships, wasted property, and drowned men, thankfully and reverentially to accept the lesser evil with the greater good that Divine Providence has willed for us; and manfully, as heretofore, to strive to lessen the effects of the evil. And may we not feel sure that in so doing we are fulfilling at least one of the objects for which evil is permitted in this imperfect state of existence, viz., the stirring us up to the active exercise of the higher functions of our nature, as manifested in our duties one to another, which an unmixed good would fail to awaken within us.

Let us, however, turn our thoughts to the more practical part of the subject—the rescue of the shipwrecked sailor whom the storm has cast away on our shores, and truly we shall find enough to enlist our sympathy and aid in his behalf. Let us contemplate him lashed to the rigging or the bulwark of his craft, breaking up beneath his feet, with the great surf leaping over her, and nought but the huge waves breaking and roaring all around; when, with his life's blood chilling in his veins, death staring him in the face, and his heart failing him from

fear, his thoughts are turned—may be for the last time—towards those who will mourn his loss in his distant home; when, except he should be able to descry the boat of mercy coming to his aid, he knows his last hour is come.

Or again let us change the scene, and depict to our mind's eye a corresponding scene on shore:—the night is dark, the cold wintry wind and drenching rain, or blinding snow have driven every living creature to the shelter of its home, but the few hardy men whose business is with wrecks, or the Coast-patrol whose duty ties him to the shore. Suddenly a signal-light is seen at sea—experienced eyes know but too well the tale it tells. The alarm is given, and quickly, but at first one by one, the hardy boatmen of the place, emerge from their humble dwellings, and soon an anxious crowd is gathered together, women and even children have mingled with it; there is a running hither and thither—answering lights are shown to those at sea. Presently the life-boat on its carriage, drawn by horses or by men, comes rapidly to the spot, and is soon at the water's side. The determined men who form her crew are seated in her—anxious, and often weeping women, their wives and relations are gathered round—the launching ropes are manned—there is a plunge, and the noble boat and her nobler freight have disappeared amid the thick darkness, and nought is seen or heard but the roar of the waves as they raise their huge crests and fall heavily and continuously on the shore.

Reader, this is no imaginary picture—it is one which has been repeated many times in this and last month's gales as shown in the annexed list; during those gales no less than two hundred and sixty-seven lives of human beings have been saved by the National Life-boat Institution alone, nearly the whole of whom would undoubtedly have perished but for that aid.

These noble services have varied much in character; many have been in the dark hours of night, others have been by day: some have been at short distances from the shore, others on the outlying banks far from the land. In some cases greater danger has been incurred than in others. In some, men have been washed overboard from the boats but recovered again. One of the Institution's life-boats was upset when returning to her station; but although with sails set at the time, and the sheets kept fast, she soon righted herself again, and none of her crew were lost. But another life-boat, the property of boatmen, of Gorlestone, on the Norfolk coast, was upset by collision with another vessel and no less than twenty-five of those on board her perished.

Indeed the work of saving shipwrecked persons, even in the best appointed life-boats, must ever be one of danger, and no little courage and hardihood is required on the part of those who engage in it. In giving their invaluable aid they perform their full share of the duty of alleviating and reducing the amount of the misery and evil produced by the storms on our coasts. It remains for those who cannot share the risk and exposure which these brave men incur, to perform their part of this humane work, by enabling the Institution, which has undertaken to organize and superintend it—to provide the life-boats'

crews with every means of safety and efficiency, and to remunerate them sufficiently—to serve as some encouragement to them in return for the risks and labour and exposure which they undergo.

The Institution accordingly appeals to all humane and generous persons in the United Kingdom to contribute from their abundance towards so good a cause.

The following is a list of the services of the boats of the National Life-boat Institution during the heavy gales of last November and December:—

	No. of Lives Saved.
Nov. 16-17.—The *Manley Wood* life-boat at Poole rescued the crew of 10 men and 36 labourers from the brig *Contest*, of Guernsey, which was wrecked on the Hook Sand at the entrance of Poole Harbour.....	46
Nov. 17.—The *Grocers'* life-boat at Mundesley saved 1 man from the brig *George*, of Sunderland, which was wrecked off that place	1
Nov. 18.—The same life-boat also rescued 6 men from the schooner *Restless*, of Peterhead, which became a total wreck on Hasborough Sands	6
Nov. 17.—The *Duff* life-boat at Great Yarmouth was the means of taking the smack *Plowman*, of Yarmouth, and her crew of 7 men safely into Lowestoft Harbour	7
Nov. 17.—The Lowestoft life-boat saved 2 out of the crew of 5 men of the brigantine *Madora*, of Yarmouth, which became a total wreck on the north end of Newcome Sands.....	2
Nov. 17.—The *Baroness Windsor* life-boat at Penarth rescued the crew of 11 men of the brig *Marie*, of Greffswald, which had stranded on Ranie Spit	11
Nov. 17.—The *Royal Wiltshire* life-boat at Dover remained alongside the schoner *Remedy*, of Whitstable, which was in a dangerous position near the Admiralty Pier, until the vessel was out of danger	
Nov. 17.—The *City of Worcester* life-boat at Bembridge, I.W., was launched to the assistance of the brig *Bessie*, of Sunderland, which was observed to anchor off that place in a dangerous position. Acting on the advice then given him, the master ran his vessel into Bembridge Harbour, thus securing the safety of ship and crew	
Nov. 18.—The *Western Commercial Traveller* life-boat at Cadgwith, Cornwall, was lent to her fishermen crew at their earnest request, and the men were then enabled to put out and save their seine net, which had broken away from its fastenings during the gale and was drifting away to sea	
Nov. 18.—The *Licensed Victualler* life-boat at Hunstanton saved the crew of 16 men of the barque *Thetis*, of Gothenburg, which had stranded on the Wool Pack Sand, about seven miles from Hunstanton	16
Dec. 7.—The same life-boat saved the crew of 15 men of the S. S. *Harmonia* of Hamburgh, which became a total wreck on a sand bank near Brancaster	15
Dec. 2.—The *Birmingham No.* 1 life-boat at Sutton saved 7 men from the ship *Clarinda*, of Sunderland, which had stranded off Ingoldsmill	7
Nov. 18.—The *Birmingham No.* 2 life-boat at Caister assisted to save the Norwegian schooner *Polydesa* and her crew of 5 men, which vessel had stranded on the Cross Sand	5
Nov. 25.— The *Boys'* life-boat at the same place remained alongside the stranded schooner *Assistant*, of Stavanger, until that vessel was safely got off the Barber Sand	

Nov. 27.—The Bradford life-boat at Ramsgate, under the management of the Board of Trade, and two Broadstairs life-boats not belonging to the Institution, assisted to get the schooner *Dunkerquoise*, of Dunkirk, off the North Sand Head. She was, however, so disabled that she sank before she could be got into harbour. The crew were, however, saved by one of the Broadstairs life-boats ..

Dec. 1.—The Bradford life-boat also rescued the crew of 8 men of the brigantine *Amor*, of Elsfleth, which had stranded on the north-west spit of the Goodwin Sands..... 8

Dec. 3.—The Bradford life-boat again went out and saved the brig *Cruiser*, of Hartlepool, and her crew of 6 men which vessel had stranded on the Goodwin Sands 6

Nov. 30.—The *Thomas Wilson* life-boat at Whitburn was the means of saving the crew of 6 men of the brig *Jenny*, of Whitby, which became a total wreck on Cape Kerr Point, off Whitburn..... 6

Nov. 30.—The *Grace and Lally* life-boat at Kessingland went to the assistance of the Brigantine *Medora*, of Seaham, which was in a very critical position on the Barnard Sand. The vessel was got off the Sand, and with her crew of 6 men safely taken into Lowestoft Harbour 6

Dec. 1.—The *Princess of Wales* life-boat at Holyhead saved 34 persons from the ship *Lydia Williams*, of Liverpool, which sunk on Salt Island; 12 persons from the barque *Bayadere*, of Rouen; and 7 persons from the schooner *Elizabeth*, of Liverpool, which were in distress off Holyhead 53

Dec. 1.—The Oxfordshire life-boat at Looe remained alongside the schooner *St Brannock*, of Bideford, which vessel had stranded near Maymean, near Looe Island. Ultimately the vessel was got off and taken into harbour, the life-boat assisting on the occasion .....

Dec. 1.—The *Zelinda* life-boat at Portrush, after several trials, saved the crew of 6 men of the brigantine *Vitruvius*, of Liverpool, which had stranded on Curran Point 6

Dec. 2.—The *Herbert Ingram* life-boat at Skegness saved 2 men from the sloop *Ant*, of Boston, which became a total wreck on Skegness Beach .. 2

Dec. 3.—The same life-boat also took the captain ashore from the schooner *Elizabeth*, of Louth, which had stranded on the main below Gibraltar Point. He then proceeded to Boston to get the assistance of a steamer and lighter to get his vessel off.

Dec. 2.—The *Moses* life-boat at St. Ives, after repeated trials with different crews, saved 1 man from the French brig *Courrier du Nord*, which became a total wreck on St. Ives Ridge.... 1

Dec. 2.—The *Miriam* life-boat at Buckie rescued the crew of 4 men of the sloop *Hellens*, of Alloa, which became a total wreck off Buckie .. 4

Dec. 2.—The *North Briton* life-boat at Donna Nook brought ashore 6 men from the schooner *Esk* of Montrose, which had gone ashore on the sands off Donna Nook 6

Dec. .—The *Admiral Henry Meynell* life-boat at Ballywater went off to the distressed ship *Annie Gray*, and remained alongside her for some hours, until she got out of her perilous position .....

Dec. 4.—The Cromer life-boat put out to the assistance of the dismasted brig *White Rose*, of Brixham, and at the request of the master stayed by her for several hours, until the weather moderated. Two steam-tugs arrived to tow the vessel into Yarmouth Harbour.....

Dec. 3.—The *Duncan* life-boat at Sheringham saved 3 persons from the schooner *Hero*, of Maldon, which had stranded opposite Beeston Hills, near Sheringham 3

Dec. 3.—The *Ann Maria* life-boat at

Winterton, saved 2 men from the schooner *Sophia*, of Colchester, which had stranded on Winterton, Ness Point..... 2

Dec. 3.—The life-boat at Pakefield saved 1 man from the brig *Queen Victoria*, of South Shields, which became a total wreck on the Barnard Sand..... 1

Dec. 6.—The life-boat crew at Penmon, Anglesey, and some volunteers, saved the lives of 22 persons from an American ship named the *T. G. Southand*, which had stranded on the rocks near Penmon..... 22

Dec. 6.—The life-boat at St. Andrew's N.B., saved the crew of 4 men of the sloop *Christian and Charlotte*, of Peterhead, which had stranded off the entrance to the harbour 4

Dec. 7.—The *Willie and Arthur* life-boat at New Brighton rescued 13 men from the ship *Thornton*, of New York, which became a total wreck on the West Middle Sands 13

Dec. 8.—The *Albert Edward* life-boat at Padstow saved the crew of 3 men of the smack *Telegraph*, of Port Isaac, which had stranded on the Doom Bar 3

Dec. 10.—The *Royal Berkshire* life-boat at Aberdovey, brought safely into harbour the stranded schooner *Jane Sophia*, of Aberystwith, and crew of 4 men, which vessel had gone ashore on the South Bank 4

Total lives saved by life-boats during heavy gales of Nov. and Dec. last..... 267

Ditto, ditto, in the first ten months of 1867 524

Grand total 791

Having thus given merely a synopsis of the noble services performed by the life-boats of the Institution during the heavy gales of November and December, we think some conception of the character of many of them may be realised by the following simple but most interesting narrative of a life-boat service, given by the coxswain of the life-boat *North Briton* stationed at Donna Nook, to Henry Pye, Esq., the hon. secretary of that branch of the institution :—

" On Sunday last (the 1st December), the weather being very stormy, I, with six others, and two horses, at twelve o'clock at night, walked the coast for upwards of four miles in the direction of Grainthorpe Haven, when we discovered a schooner on the sands, which the crew (consisting of three men) were about to leave. Her name was the *Mary Ant*, of Whitby, in ballast. The men being strangers, and much fatigued, we took them back to Donna Nook on the horses, where I put them to bed. and at 2 30 the same night we again left the Nook and went back to the schooner and moored her, and while there discovered another schooner throwing up signals of distress and burning tar-barrels between Mr. Pye's house and the station, when we immediately returned—it being then about five o'clock a.m., sent messengers for the crew and the launching men, and at daylight, about seven a.m., hoisted my flag to expedite the crew, which signal was also seen by the crew of the schooner. We got the boat off about eight a.m., but the heavy gale holding up the tide, the horses had to go a mile and a quarter belly deep before reaching the outer bank of sand so as to get to the windward of the schooner, but the tide running so rapidly, backed up by the wind, the launching men,

being up to their armpits in water, could not stand to pull the boat off the truck, and were obliged to get into the boat, when we shoved her off the truck and over the bank with our oars, and with great difficulty reached the schooner, which proved to be the *Esk*, of Montrose, in ballast. After making fast the boat by anchor and ropes, we succeeded in getting six hands aboard the boat, and brought them back as far as the above bank, where she grounded, and all hands (except the crew of the schooner) got out, and, up to their middle in water, dragged the boat as far as they could; but not being able to get clear, all got out except myself, and waded up to their middle—occasionally being submerged by the lift of the waves—upwards of a mile to the station-house, which they reached about 12.30, but all so frozen and starved that it was necessary to send for a medical man, who restored most of them before he left, one Coastguardsman being still under treatment, though better this morning. I remained with my boat and truck so secure them from loss or damage, and did not get up till late at night, when I found that none of the farmers would let their horses go out again, they being so starved as to peril their lives. I then waded back to my boat with another Coastguardsman, when we discovered a third schooner at six a.m., with signals of distress flying nearly eight miles away. When I got back to the station again, I sent for the crew and launchmen, but none of the neighbouring farmers would allow their horses to go out again—indeed, they could scarcely keep them alive from their first exposure to the cold, so that I was obliged to abandon the effort to get to the vessel; and it was not till the evening of the day that I could get any horses to bring back the boat to the station. The gale having then considerably moderated, we got her up without sustaining any injury. I never experienced a more trying time for men and horses. I never had my clothes off from the Saturday night to Tuesday night, or any rest, being soaked through all Monday and Tuesday. The crew of the third schooner referred to were saved by Hoodless riding into the water and bringing them. It should be added, that many parts of the Lincolnshire coast are very flat, and oftener shallower at some distance from the land. (Signed) Thomas Dobson, coxswain of the life-boat."

We feel constrained to add another account of the noble services rendered, during Sunday night, the 1st December, and the following day, by the life-boat *Princess of Wales*, stationed at Holyhead, in rescuing altogether, including a mother and her infant, 53 persons from different wrecks.

"*Holyhead, Dec. 2nd.*—We have been visited with a most terrific gale from the north here, and but for the indefatigable and courageous conduct of the crew of the life-boat *Princess of Wales*, belonging to the National Life-boat Institution, we should have been in much distress. We have had four wrecks. The first was the barque *Bayadere*, of Rouen. She parted and came on the rocks near the lighthouse. The life-boat was launched at 9 p.m. in the face of all difficulties, heavy sea and lee shore, and brought all on board the vessel safely to land, 12 in number. The life-boat then went out three

separate times to the ship *Lydia Williams*, of Liverpool, that had sunk near Salt Island, and brought 34 persons on shore. The crew of the ship were in the rigging, and among them a lady passenger, with an infant 7 months old. After two trips two men were left in the fore-rigging, so they again had to return. At 5 a.m. she was again manned and sent to act near the breakwater to save the crew of the schooner *Seetland*, of Chester. The men were, however, saved by means from the breakwater. On this occasion the boat beat off in the most wonderful style to the breakwater, through some terrific squalls of snow and hail; and I confess I like this boat, although I have always previously thought her too heavy to pull in a gale of wind. Her sailing powers are very great. The last time the life-boat went off in reply to a signal of distress she brought 7 persons from the schooner *Elizabeth*, of Liverpool, making 53 in all saved—a good 24 hours' work. Nothing that I can express can be too strong for my admiration of the men, for a worse night I never saw; it was just such a night as the *Royal Charter* gale. Six separate times the boat was manned, and did good service with her veteran coxswain, Roland, over seventy years old. I think all parties freely acknowledge the service performed, and the French captain and his agent are particularly grateful, and have so expressed themselves. (Signed) CHARLES F. SCHOMBERG, Rear-Admiral."

In addition to the services already referred to, the crews of the life-boats at the following places also either assembled or went off during the same gales with the view of rendering assistance; but in some cases, their services were not required; in others, the crews of the vessels had unhappily perished before the arrival of the boats, or the vessels had got out of danger. The boats were—the *Albert Victor*, at Berwick-on-Tweed; the *Grace Darling*, at Holy Island; the *Joseph Anstice*, at North Sunderland, Northumberland. The *Pelican*, at Withernsea; and the *Robert Whitworth*, at Bridlington Quay, Yorkshire. The *North Briton*, at Donna Nook; the *Dorinda and Barbara*, at Theddlethorpe; the *Birmingham* No. 1, at Sutton, Lincolnshire. The *Brightwell*, at Blakeney; the life-boat at Cromer; the *Recompense* at Bacton; the *Huddersfield* at Hasborough; the *Parsee* at Palling; the *Birmingham* No. 2 at Caister; the *Duff*, at Yarmouth, Norfolk. The *Grace* and *Lally of Broad Oak*, at Kessingland, Suffolk. The *Quiver* No. 1 at Margate; the *Bradford* at Ramsgate; the *Sabrina* at Kingsdowne; and the *Providence* at Dungeness, Kent. The *Arthur Frederick FitzRoy* at Rye; and the *Storm Sprite* at Winchelsea, Sussex. The *Oxfordshire* at Looe; the *Daniel J. Draper* at Mullion; and the *Isis* at Hayle, Cornwall. The *Sir Edward Perrott* at Fishguard, Pembrokeshire. The *Cotton Sheppard* at Porthdinllean; and the *Sisters' Memorial* at Orme's Head, Carnarvonshire. The life-boat at Drogheda; The *Robert Theophilus Garden* at Wicklow; and the *Quiver* No. 2 at Queenstown, Ireland.

On many occasions of the life-boats proceeding out with the view of saving life from shipwreck, the services were of a most arduous

character, as the following accounts of two such cases furnished by the Hon. Secretaries of the Sutton and Kingsdowne Branches of the Institution, will show:—

"KINGSDOWNE, KENT, *Dec. 1st.*

"Last night, during the heavy storm of wind and rain, and in the almost impenetrable darkness, the South Sand Head light-ship fired guns and exhibited rockets, and soon after tar-barrels on fire were seen on the Goodwin Sands. Immediately after the *Sabrina* life-boat was launched, and after some little difficulty, owing to the heavy surf, was got off, and sailed to the spot where the light appeared to burn, but when she reached the sands no trace of a vessel could be found, and the darkness, together with the heavy showers, prevented their being able to make out anything, or to make much of a search, especially as the sea, was breaking tremendously over the sands. After trying various tacks, and finding no vessel, the life-boat was obliged to run for Ramsgate Harbour, as the wind prevented her returning to Kingsdowne. It was an awful night, and the life-boat men did their work nobly. There are no tidings of the wreck or of the crew. The Walmer boat, it seems, also went out, but could find no trace of the vessel on the sands. (Signed) T. SYDENHAM CLARKE."

SUTTON, LINCOLNSHIRE.—"On Sunday, the 17th November, a messenger arrived from a neighbouring village called Chapel, with the intelligence that a vessel was lying off that place with signals of distress flying. The crew of the life-boat, *Birmingham No.* 1, was immediately mustered, and the boat was taken on her carriage along the coast with a sufficient number of men to launch her if required. On arriving at a point of the coast about four miles from Sutton, the crew of the life-boat were informed that the ship had sunk, which, by the aid of a telescope, was found to be the case, the masts being just discernable above the water. It was the opinion, however, of some of the men on the beach that, at least, a portion of the crew were in the rigging. The wind was at this time blowing a gale directly from the east, dead on land, and the sea running very high. The coast, too, was much interspersed with clays, which much increased the difficulty of launching the boat, and the night coming rapidly on, the chances of finding the vessel were very small. The boat, however, was quickly launched and soon disappeared amongst the breakers. It was now quite dark, and judging that the boat would land some distance farther south, the Honorary Secretary of the Sutton Branch, Mr. ROBERT BROOKS, Jun., together with the launchers and the life-boat carriage, proceeded some three miles further to the village of Chapel, directly off which place the vessel had sunk. After the lapse of about three hours the life-boat's crew landed, drenched with wet, and much exhausted. They had been unable to find the ship in the darkness, but as it was still thought that some of the crew might be with the ship, it was determined to wait the approach of morning and then again to launch the boat. This was done, but the ship had broken up during the night, and the dawn only discovered a mass of floating

wreck. The boat was replaced on her carriage and taken home by land to Sutton, where it arrived about six p.m., after a long and *arduous service of about twenty-seven hours*. The ship was the *Ardent*, of Ipswich, and no tidings have been received of her unfortunate crew. The life-boat men had been the whole time of the service without rest, and the greater part of it in their wet clothes. The boat behaved most admirably on the occasion, and the crew had the greatest confidence in her."

The following is a general list of the services of the life-boats of the NATIONAL LIFE-BOAT INSTITUTION during the past year 1867 (to the 16th December) :—

	No. of Lives saved.
Schooner *Mary Tatham*, of Chester....	4
Brig *Chase*, of Shields	5
Schooner *Mizpah*, of Dartmouth	8
Barque *Aurora Borealis*, of Rebe	10
Sloop *Oliver Lloyd*, of Cardigan	3
Smack *Turtle Dove*, of Aberystwith ..	3
Brig *Emanuel Boucher*, of Whitby....	6
Smack *Coronation*, of Bideford	4
Schooner *Teazer*, of Ipswich	1
Sloop *Shamrock*, of Liverpool	3
French schooner *Anemone*	5
Schooner *Gem*, of Hull	2
Brigantine *Seraphim*, of Dunkirk	8
Lugger *Espoir*, of Nantes	6
Schooner *Salome*, of Brixham	6
Schooner *Selina Ann*, of Looe	5
Schooner *Heiress*, of Teignmouth	6
Ship *John Gray*, of Glasgow	13
Brig *Antares*, of Grieffswald	1
Schooner *Jeanne d'Arc*, of Nantes—Saved vessel and crew.....	5
Smack *Catherina*, of Barmouth—Saved vessel and crew	4
Smack *Noah*, of Cardigan	2
Schooner *The Clyde*, of Great Yarmouth	5
Schooner *Jane Ellen*, of Aberystwith—Saved vessel and crew	5
Brig *Anne*, of Milford—Assisted to save vessel and crew	8
Barque *Marie Amelie*, of Quimper—Assisted to save vessel and crew ..	14
Brig *Benton*, of South Shields	6
Brig *Mary*, of Sunderland—Assisted to save vessel and crew	8
Sloop *Perseverance*, of Liverpool	2
Barque *Chowdean*, of Sunderland—Assisted to save vessel and crew ..	10
Sloop *Emma*, of Portsmouth—Saved vessel and crew	3
Sloop *Telegraph*, of Sunderland	3
Barque *Coquimbo*, of Sunderland	15
Ship *Cameronian*, of Liverpool—Saved vessel and crew	20
Brigantine *Eclipse*, of Londonderry ..	1
Schooner *Gratitude*, of Aberystwith ..	4
Smack *Striver*, of Great Yarmouth—Saved vessel and crew	5
Schooner *The Squire*, of Great Yarmouth	4
Brig *Sarah Ann*, of Jersey	6
Schooner *Mary Lewis*, of Aberystwith	5
Schooner *Devonia*, of Padstow	5
Barque *Loretto*, of Liverpool—Assisted to save vessel and crew	14
Barque *Centurion*.....	18
Barque *Wild Horse*, of Windsor, N.S.	10
Schooner *Mary*, of Dublin	3
Brig *Harmony*, of Bideford.....	3
Schooner *La Prudence*, of Algiers	6
Sloop *William*, of Paimpol	6
Austrian schooner *Nicolo*	14
Prussian Schooner *Louise*—Assisted to save vessel and crew	7
Brigantine *Estella*, of Preston—Saved vessel.	
Barque *A. L. Routh*, of New York—Saved vessel and crew.....	16
Schooner *Glyde*, of Killough	5
Barque *Susan L. Campbell*, of Weighmouth, N.S.	14
Ship *Nor' Wester*, of Boston, U.S. ..	5
Brig *Wellington*, of Aberystwith—Assisted to save vessel and crew.....	9
Brig *Mary*, of Workington—Rendered assistance,	

Schooner *Mary*, of Lynn—Rendered assistance.
Fishing-smack, of Holy Island—Saved vessel and crew 4
Brig *Ayrshire Lass*—of Ardrossan—Saved vessel and crew..... 4
Royal Mail Steamer *Leinster*—Rendered assistance.
Smack *Choice*, of Hull 3
Schooner *New Whim*, of Portsmouth 3
Brig *Amicizia*, of Genoa..... 14
Ship *Blanche Moore*, of Liverpool.... 36
Brig *Spey*, of Jersey—Remained by vessel.
Brigantine *Union*, of Cowes 7
Brig *William and Sarah*, of South Shields—Vessel saved.
Schooner *Hope*, of Beaumaris—Saved vessel and crew 3
Smack *Robert Hudson*, of Arklow 4
Schooner *Splendid*, of Dublin—Saved
Smack *Kate and Mary*, of Arklow—Saved vessel 1
Smack *Jane*, of Carnarvon —Assisted to save vessel and crew 4
Seven fishing-boats, belonging to North Sunderland, Newton, and Craster—Assisted to save vessels and crews .. 30
Brigantine *Sybel*, of Yarmouth 4
Schooner, *Commot*, of Whitby..... 4
Fishing-boat of Newbiggin—Rendered assistance.
Barque *Achilles*, of Glasgow 3
Barque *James Campbell* of Shelburne, N.S. 11
Ship *Michiels Loss*, of Antwerp—Rendered assistance.
Brig *Ruth*, of London..... 9
Smack *Margaret Davies*, of Girvan .. 8
Newarp Light Ship—Rendered Assistance.
Smack *Queen Victoria*, of Brixham—Saved vessel and crew..... 2
Barque *Lord Collingwood*, of Newcastle —Remained by vessel all night.
Brigantine *Madora*, of Great Yarmouth 2
Brig *Bessie*, of Sunderland—Rendered assistance.
Barque *Thetis*, of Gothenburg 16
Brig *Marie*, of Grieffswald 11
Brig *Contest*, of Guernsey 46
Brig *George*, of Sunderland 1
Smack *Plowman*, of Great Yarmouth —Saved vessel aud crew..... 7
Norwegian schooner *Polydesa*—Saved vessel and crew..... 5
Cadgwith fishing-boats — Assistance Rendered.
Schooner *Restless*, of Peterhead 6
Schooner *Remedy*, of Whitstable—Remained by vessel.
S. S. *Harmonia*, of Hamburg..... 15
Ship *Clarinda*, of Sunderland 7
Schooner *Assistant of Stavanger*—Remained by vessel.
Schooner *Dunkerquoise*, of Dunkirk—Rendered assistance.
Brigantine *Amor*, of Elsfleth 8
Brig *Cruiser*, of Hartlepool—Vessel and crew saved..... 6
Brig *Jenny*, of Whitby 6
Brigantine *Medora*, of Seaham—Assisted to save vessel and crew 6
Ship *Lydia Williams*, of Liverpool.... 34
Barque *Bayadere*, of Rouen 12
Schooner *Elizabeth*, of Liverpool 7
Schooner *St. Branock*, of Bideford—Rendered assistance.
Brigantine *Vitruvius*, of Liverpool.... 6
Sloop *Ant*, of Boston 2
Schooner *Elizabeth*, of Louth..... 1
French brig *Courrier du Nord* 1
Sloop *Hellens*, of Alloa 4
Schooner *Esk*, of Montrose..... 5
Ship *Annie Gray*—Remained by vessel.
Brig *Wild Rose*, of Brixham—Remained by vessel.
Schooner *Hero*, of Maldon 3
Schooner *Sophia*, of Colchester 2
Brig *Queen Victoria*, of South Shields 1
American ship *T. J. Southend* 22
Sloop *Christian and Charlotte*, of Peterhead 4
Ship *Thornton*, of New York 13
Smack *Telegraph*, of Port Isaac..... 3
Schooner *Jane Sophia*, of Aberystwith —Saved vessel and crew..... 4
Total lives saved in 1867 (to 16th December), by life-boats 791
During the same period the Institution has granted rewards for saving lives by fishing and other boats 303
Grand total of lives saved 1094

General Summary for 1867 *(to 16th December).*

			£ s. d.
Number of lives rescued by life-boats, in addition to 35 vessels saved by them	..	791	
Number of lives saved by shore-boats, etc.	..	303	
Amount of pecuniary rewards for saving life	..	..	3,006 12 2
Honorary rewards: Gold and Silver Medals	13	..	
Votes of Thanks on Vellum and Parchment	13	..	
Total	26	1,094	3,006 12 2

Since the beginning of the past year, 1867, the Institution has also expended £29,557 on its 186 life-boat establishments on the coasts of England, Scotland, and Ireland.

The number of lives saved, either by the life-boats of the Society, or by special exertions for which it has granted rewards, since its formation, is 16,995 for which services 83 gold medals, 779 silver medals, and £26,500 in cash, have been given as rewards. The Institution has also expended £191,721 on its 186 life-boat establishments.

The Russian Compass.

To the Editor of the Nautical Magazine.

Sir,—Some time ago there appeared in your Magazine several columns showing the various points of the Compass, in six or seven different languages. I send you the Russian, which perhaps you would like to add to those already published. To all men engaged in nautical matters I am sure they will be exceedingly useful.

I have added the French to this list as so much of the Russian is translated into that language.

It is particularly to be noticed that the O. and N.O. points of the Russian (corresponding with the German) are the E. and N.E., and *not* Ouest (O.) and Nord-ouest (N.O.) of the French. This has led to many errors in reading French translations of Russian sailing directions, etc.

The English characters and abbreviations are added, as they will be useful to those who have no knowledge of the Russian characters.

I am, sir, your obedient servant,

R. C. Carrington, *Hyd. Off.*

Surbiton, S.W.,

December 16*th*, 1867.

English.	French.	Abbreviations.	Russian.	English Characters.	Abbreviations.
North	Nord	N.	Нордъ	Nord	N.
North by east	Nord quart nord-est	N. q N.E.	Нордъ тень остъ	Nord ten ost	N. t O.
North-north-east	Nord-nord-est	N.N.E.	Нордъ-нордъ-остъ	Nord-nord-ost	N.N.O.
North-east by north	Nord-est quart de nord	N.E. q N.	Нордъ-остъ тень нордъ	Nord-ost ten nord	N.O. t N.
North-east	Nord-est	N.E.	Нордъ-остъ	Nord-ost	N.O.
North-east by east	Nord-est quart d'est	N.E. q E.	Нордъ-остъ тень остъ	Nord-ost ten ost	N.O. t O.
East-north-east	Est-nord-est	E.N.E.	Остъ-нордъ-остъ	Ost-nord-ost	O.N.O.
East by north	Est quart nord-est	E. q N.E.	Остъ тень нордъ	Ost ten nord	O. t N.
East	Est	E.	Остъ	Ost	O.
East by south	Est quart sud-est	E. q S.E.	Остъ тень Зюидъ	Ost ten züd	O. t S.
East-south-east	Est-sud-est	E.S.E.	Остъ-Зюидъ-остъ	Ost-züd-ost	O.S.O.
South-east by east	Sud-est quart d'est	S.E. q E.	Зюидъ-остъ тень остъ	Züd-ost ten ost	S.O. t O.
South-east	Sud-est	S.E.	Зюидъ-остъ	Züd-ost	S.O.
South-east by south	Sud-est quart de sud	S.E. q S.	Зюидъ-остъ тень Зюидъ	Züd-ost ten züd	S.O. t S.
South-south-east	Sud-sud-est	S.S.E.	Зюидъ-Зюидъ-остъ	Züd-züd-ost	S.S.O.
South by east	Sud quart sud-est	S. q S.E.	Зюидъ тень остъ	Züd ten ost	S. t O.
South	Sud	S.	Зюидъ	Züd	S.
South by west	Sud quart sud-ouest	S. q S.O.	Зюидъ тень вестъ	Züd ten vest	S. t W.
South-south-west	Sud-sud-ouest	S.S.O.	Зюидъ-Зюидъ-вестъ	Züd-züd-vest	S.S.W.
South-west by south	Sud-ouest quart de sud	S.O. q S.	Зюидъ-вестъ тень Зюидъ	Züd-vest ten züd	S.W. t S.
South-west	Sud-ouest	S.O.	Зюидъ-вестъ	Züd-vest	S.W.
South-west by west	Sud-ouest quart d'ouest	S.O. q O.	Зюидъ-вестъ тень вестъ	Züd-vest ten vest	S.W. t W.
West-south-west	Ouest-sud-ouest	O.S.O.	Вестъ-Зюидъ-вестъ	Vest-züd-vest	W.S.W.
West by south	Ouest quart sud-ouest	O. q S.O.	Вестъ тень Зюидъ	Vest ten züd	W. t S.
West	Ouest	O.	Вестъ	Vest	W.
West by north	Ouest quart nord-ouest	O. q N.O.	Вестъ тень нордъ	Vest ten nord	W. t N.
West-north-west	Ouest-nord-ouest	O.N.O.	Вестъ-нордъ-вестъ	Vest-nord-vest	W.N.W.
North-west by west	Nord-ouest quart d'ouest	N.O. q O.	Нордъ-вестъ тень вестъ	Nord-vest ten vest	N.W. t W.
North-west	Nord-ouest	N.O.	Нордъ-вестъ	Nord-vest	N.W.
North-west by north	Nord-ouest quart de nord	N.O. q N.	Нордъ-вестъ тень нордъ	Nord-vest ten nord	N.W. t N.
North-north-west	Nord-nord-ouest	N.N.O.	Нордъ-нордъ-вестъ	Nord-nord-vest	N.N.W.
North by west	Nord quart nord-ouest	N. q N.O.	Нордъ тень вестъ	Nord ten vest	N. t W.
North	Nord	N.	Нордъ	Nord	N.

Clearing the Lunar Distance.

A New Lunar Method.

The method here proposed is short and simple, and requires no subsidiary tables except a very small table, and the result is always correct to within a second or two. For an example :—

Sun's app. alt.	5° 41′	- - - - - corr. of alt.	8′ 48″
Moon's app. alt.	35° 11′	- - - - - do.	44′ 58½″
App. Distance	41° 57′ 44		
	82° 50′		
½ sum - - -	41° 25′	cosin. 9·8750	
1st rem. - -	35° 44′	sin. 9·7664)	
2nd rem. - -	6° 14′	cosec. 0·9643)	- 10·7307 from
3rd rem. - -	0° 33′	see 0·0000	
		2)20 6057	
	63° 32′ =	tan 10·3029	- - 10·3029 subtract
	2		tan 0·4278
Moon's angle nearly -	127° 4′		= 60° 31½′
			2
Correction per small table	+ 9	Sun's suppl. angle	= 139° 3′
Moon's true angle - -	127° 13′	secant 0·2184	secant 0·1219
			Sun's corr. of alt. p. log. 1·3108
Moon's corr. of alt. -	44′ 58½″	prop. log. 0·6023	p. log. 1·4327
Moon's corr. of dist. -	27′ 12″ =	prop. log. 0·8207	Sun's corr. of dist. - 6′ 39″
			Moon's do. 27′ 12″
			2nd do. 0′ 13″
			App. Dist. 41° 57′ 44″
			True distance 42° 31′ 48″
			Ditto by Borda's formula 42° 31′ 47″

Notes.—Observe always to write down the sun's (or a star's) app. alt. *first*, and the app. dist. *last.*

Add the correction of dist. to the app. distance, when the angle at the moon or sun is *greater* than 90°, but subtract it when the angle is less than 90°.

For the moon's 2nd corr. of dist.—Enter Raper's Table 56, or

Norie's XXXV., with the app. dist. and the moon's corr. of alt., and take out the seconds. Enter again with the moon's corr. of dist. and take out the seconds, and the diff. of these corresponding seconds is the moon's 2nd corr. of dist. to be *added to*, or subtracted from, the app. distance according as the distance is *less* or greater than 90°.

For correcting the moon's approximate angle.—Enter the small table with the sun's angle, and the app. distance, take out the corresponding quantity, which multiply by the sun's refraction *in minutes*, and add the product to the approx. angle to obtain the true angle.

Sun ∠	Apparent Distance.											Sun's angle
	20°	25°	30°	35°	40°	45°	50°	60°	70°	80°	90°	
5°	0′·3	0′·2	0′·2	0′·2	0′·1	0′·1	0′·1	0′·1	0′·1	0′·1	0′·1	175°
10	0·5	0·4	0·3	0·3	0·3	0·2	0·2	0·2	0·2	0·2	0·2	170
20	1·0	0·8	0·7	0·6	0·5	0·5	0·5	0·4	0·4	0·4	0·3	160
30	1·5	1·2	1·0	0·9	0·8	0·7	0·7	0·6	0·5	0·5	0·5	150
40	1·9	1·5	1·3	1·1	1·0	0·9	0·8	0·7	0·7	0·7	0·6	140
50	2·2	1·8	1·5	1·3	1·2	1·1	1·0	0·9	0·8	0·8	0·7	130
60	2·5	2·1	1·7	1·5	1·3	1·2	1·1	1·0	0·9	0·9	0·8	120
70	2·7	2·2	1·9	1·6	1·5	1·3	1·2	1·1	1·0	0·9	0·9	110
80	2·9	2·3	2·0	1·7	1·5	1·4	1·3	1·1	1·1	1·0	0·9	100
90	2·9	2·4	2·0	1·7	1·6	1·4	1·4	1·2	1·1	1·1	1·0	90
Sun ∠	Apparent Distance.						130°	120°	110°	100°	90°	Sun's angle

I have much to thank my friend Mr. A. C. Johnson, R.N., for his kindness in suggesting to substitute the sun's *supplement* angle for the angle itself to facilitate the application of the corrections of distance. I strongly recommend the "Finding the Longitude simultaneously with the Latitude at Noon" by the above gentleman, which may be had of Mr. J. D. Potter, 31, Poultry, London.

I am, etc.,
EDWD. H. HEBDEN, JUN.,
of Scarborough.

PARA RIVER AND THE TOCANTINS.

IN our last October number appeared an interesting account of the visit of H.M.S. Sharpshooter to the town of Cametá on the Tocantins river. The advice therein given to vessels bound to Cametá would perhaps be sufficient for our smart mercantile commanders. Some further remarks on those parts also appear in our work for November following. To these we add further directions by Commander B. W. BAX, of the *Sharpshooter*, from an official source:—

Parà Entrance.—Vessels bound to the river should make Atalaia point light (at which place a pilot for Pará can be obtained if wished), and then

stand to the westward keeping about 5 miles from the land, so as to make out each point in succession, and in not less than 6 fathoms water, until the breakers on the Braganza bank are seen, and the *white buoy* on the north side of it made out, and then the *red buoy* on the east side of the Tajoca bank. By keeping between these two buoys, and steering S.W. ½ S., both banks will be cleared. In running for the entrance, vessels must allow for the tide setting across the Braganza bank at the rate of 3 miles an hour. The directions for the Pará river are ample with the aid of the above-mentioned *buoys*, and a mud bank about 7 miles from Pará, and a quarter of a mile north of Nova Island, which by the chart appears as a bank of 15 inches water, although now an island with trees on it.

Proposed Light Vessel.—It is the intention of the local Government to establish a floating light at the entrance of the Tajoca channel.

Winds.—During the dry season a good breeze generally continues up the river making it easy for sailing vessels; coming down they can work against it with the tide.

Anchorage.—Should vessels require to wait for tide, etc., there is good anchorage in 5 to 7 fathoms, mud and sand, on the meridian of Pombas island and also off Musquiero point, in 3½ to 5 fathoms with that point bearing north. Vessels should not bring up outside the reefs, unless compelled, as by doing so they would risk losing an anchor.

Pozo Channel.—The officer surveying the entrance of the Amazon for the Brazilian Government states that the Pozo Channel is now seldom used, as its banks alter, and the tide sets across them with great velocity.

The Main Entrance to the west of Cape Magaori is yet only sufficiently known for coasters, but when properly surveyed it may become the highway of the river, from its favorable direction.

The West Entrance is only used by fast steamers with a good pilot, on account of the Prororoca, or Bore, the water being then raised 30 or 40 feet in a few minutes, in two or three rollers, which carry all before them.

Pará.—Vessels should moor within a quarter of a mile of the town, in 2 to 3½ fathoms; the depth of water at the wharf is 6 feet at low water. The city of Pará has increased greatly within the last few years, and has now many good and well-built houses in the outskirts; it is well drained, the soil is clay and sand. The roads are good, well shaded with the monjuba and palm trees, and are kept clean and in order. The Dockyard has some good buildings, but at present no work is going on; there is a gridiron for cleaning ship's bottoms, capable of taking a ship of 600 tons, and drawing 7 feet water; there is also a foundry in the city; many good shops and stores, kept by Brazilians and Portuguese, and three large British firms are established there. The population in 1866 was 36,000, of which 5,000 were slaves, and the remainder principally Indians; they were well governed and civilized.

Steam Communications.—The Amazon Company, receiving a subsidy of £140,000 per annum from the Brazilian Government (which is to continue

until the year 1877), owns eight steamers of about 600 tons each, and drawing about 6 feet water. These steamers run as far as Manáos twice a month, once a month to Tabatinga on the frontiers, and twice a month to Rio de Janerio. The New York and Rio de Janeiro Company's steamers call at Pará on the 6th or 7th of each month. A Liverpool company sends a steamer once a month, but not direct. The large subsidy granted to the Amazon company renders it difficult for other merchant ships to compete in the river trade, and it will probably continue so until the period expires to which the grant extends.

Supplies can be obained at Pará, salt meat being fivepence per pound, fresh beef sixpence, and bread fivepence per pound.

Water is supplied to shipping by boats at a charge of six shillings per ton, but it is dirty and bad. The water from the river is sufficiently good for washing purposes, though not fit for drinking at this season of the year (August).

Foreign merchants labour under no disadvantage in trading.

Exports.—The value of the exports in 1866 was nearly £800,000, of which £312,000 was conveyed in British vessels, consisting of rubber, cocoa, nuts, isinglass, and balsam.

Imports in 1866 amounted to £510,500, consisting of beer, coals, cotton stuffs, and sundries.

Shipping.—139 vessels entered in 1866, of which 69 were English the whole tonnage being 17,500.

Permission is now given for vessels of war of foreign nations to go up the Amazon river, on written application to the President of Pará.

The usual route for vessels to proceed up the river is by the pass of Goyabal and Breves channel, which carries deep water entirely; small steamers can go round the south end of Oncas island into the south branch of the Amazon, but large vessels, drawing as much as 16 feet, must proceed by the channel between Arrapiranga and Cantèjuba island.

The flood tide is not felt far beyond Breves, although the water rises there, being caused by the flood at the entrance checking the outrunning stream; so that it would be very tedious for a sailing vessel to attempt to get up far, the winds being so light and variable.

Lights have been placed by the Amazon Company as follows:—

Contèjuba, south end;
Barrh (north from Pará);
Baucuera, east side of entrance of Tocantins river;
Goyabel island, south end;
Intahy island, Breves channel; and,
Guajara river entrance.

Cametà.—A vessel bound to Cametá, on the Tocantins river, after passing Baucuera light, must shape a course between the second and third islands, off the east bank near the entrance of the river, and between two other islands inside of them, towards the east bank of the river, along which they should continue for about 18 miles in not less than 4½ fathoms water (but

generally in 7 and 8), then they may strike across S.W. to Cametá on the opposite bank, and anchor about one and a half cables off the town in 8 fathoms water.

Cametá, although containing only about 3,000 inhabitants, is an important town, as the whole trade of 1,600 miles of river passes through it, the produce being brought down from the interior in small schooners and montarias. The town is dry, the river bank there being 20 feet high, and the soil composed of red clay and sand; deep water runs close to the shore, and there is every facility for the construction of wharves. The rise of the tide is 9 feet, and the velocity of the current about 2½ miles an hour. The water of the river at Cametá is good and fit to drink. Supplies can be obtained, beef being sixpence a pound.

The land being low and thickly wooded, its general appearance is so uniform that it is difficult to distinguish one particular part from another. It is therefore desirable to obtain a pilot, but on account of the little traffic there are few who can be trusted, excepting those employed by the Amazon Company, to take charge of a vessel drawing more than 6 feet water.

The district around Cametá contains a population of nearly 30,000, of which 5,000 are slaves, the remainder chiefly native Indians, but there are many Brazilian and Portuguese families; the Indians, lead a very simple life, and are peaceable and hospitable. The police system is good, and there is a school in every village, attendance being compulsory on penalty of a fine.

Cametá is healthy, except in the rainy season (December and January), when fever and ague prevail.

The principal article cultivated is cacao, which appears to grow almost wild; rubber is brought in from the country. The value of the exports in 1866 was £22,400, and the imports £6,400.

Two steamers pass between Pará and Cametá regularly every month, and a small trading steamer occasionally.

It may be observed that if vessels were permitted to proceed direct to Cametá from sea without having to call at Pará an advantageous trade might be established, as the southern entrance to the Amazon, after passing through the Tajoca channel, is easy as far as the mouth of the Tocantins river, from which a pilot is necessary.

The Amazon itself is navigable for vessels of 1,000 tons as far as Manáos 800 miles up, at the junction of the river Negro with the Amazon. Manáos is the most important town in the interior.

All the confluents can be navigated as far as the towns mentioned in the decree, viz.:—

Tocantins,	as far as	Cametá,	100	miles from Pará.
Tapajoz,	,,	Santarem,	500	,,
Madeira,	,,	Borba,	800	,,
Negro	,,	Manáos	900	,,

The population of Santerem on the Amazon is increasing rapidly by emigration from the Southern States of America.

Climate.—The climate is very hot (80 to 90 degrees of Fahrenheit), though the mornings are cool; the heat increases as the river is ascended.

The *Brazil and River Plata Mail* contains the following further information, which shows, as might be expected, that our American friends are first in this field of enterprise and trade:—

"From Pará we have a very interesting item of news. It is nothing less than that three important tributaries of the mighty Amazon—the Ucuyali, Pachitea, and Palcazu (? Pozuzu) have been successfully navigated by steamers for a distance of 1,227 miles from the embouchure of the first-named river. This great service has been rendered by a naval expedition consisting of the Peruvian steamers Morona, Napo, and Putumayo. They started on their arduous undertaking on the 12th of November, and on the 1st of January last anchored in the Port of Maio, with the exception of the Morona, which stopped short in the island of Passos on account of a fall in the waters of the Palcazu. Many difficulties were, of course, encountered during the ascension of the rivers, in consequence of their being unsettled and unchartered, and some cannibal Indians on the banks had attempted to destroy the brave little exploring party. Their attacks were, however, vigorously repulsed, and at a place named Chontaisla the savages sustained a loss of 25 killed. The successful voyage of this expedition is destined to lead to great commercial results, for it has demonstrated the possibility of supplying several departments of Peru, possessing a population exceeding half a million, with foreign goods by way of the Amazon, and of carrying to the ocean the valuable natural products of vast and fertile regions of the interior, after a navigation from Maio, situate on the eastern slope of the Andes, of no less than 3,500 miles. Such is the field soon to be thrown open to the commerce of the world by the inauguration of the free navigation of the Amazon."

The tributaries of the Amazon above-mentioned are close up to the Peruvian mountains:—The head of the Pozuzu about 25 miles from Lima direct.

"The opening of the Amazon has already stimulated exploration. We have news from Pará of the starting from that place of a party of seven Americans on the 5th ult., to explore the lands of the Amazon, Madeira, Tapajos, and Tocantins, with the intention of selecting a location for an American settlement. The Government liberally aid in providing transport and provisions. I may further state, with special reference to the Madeira, that the Government has instructed Messrs. Keller, who ably explored the San Paulo and Parana, to examine that most important river, and to report on the best means of using it for communication with the imperial province of Matto Grosso. It may be useful to know that the head waters of the Madeira almost join those of the Paraguay in the River Plata."

New Books.

Papers on Maritime Legislation with a Translation of the German Mercantile Law Relating to Maritime Commerce. *By Ernest Emil Wendt. London: Longmans.* 1868.

The author of this work sets out by saying in his preface—"It ought never to be overlooked, that there is as much a law of the sea as there is a law of the land:" a truism, we should hardly have thought necessary to repeat in these days of Admiralty courts and others, tolerably well known to *our* Mercantile Marine at least, if not to that of our German friends. Some ancient gentleman of the long robe, whose dicta we have quoted, "Godolphin" was his name we think, who gave us the origin of maritime law, said, that "bad manners at sea begot good laws on shore" for the regulation of seamen. No doubt they were just as necessary from the times of the Venetian galleys until the present. But like all other matters, society expands, circumstances and conditions multiply, and the code of laws of the Merchant seamen of all others, like the chart by which he sails his ship, gives constant occasions for revision and amendment. Even by the very last speech of her Majesty in opening Parliament the laws for the regulation of our Merchant shipping are yet to undergo revision.

It would appear to have been on account of this announcement that the work before us was designed, with the object of pointing out what are considered by our neighbours to be defects, as well as where deficiencies occur in our system. The author enumerates no less than eighteen points of this description, which he follows up with petitions for their amendment from various countries, the subjects of which complain to have suffered from extortion in salvage cases, manœuvres of shipping agents, temptations to dishonesty, exorbitant demands for legal proceedings arising from shipping laws. These are serious matters and do little credit to the country which owns them. The first subject of complaint, which we all know by our Admiralty court proceedings to be common enough, unfortunately entails the rest, and must naturally open out all the sores which are the causes of complaint against us.

Shall we verify the old saying, and agree that "it is never too late to mend." We have no other course open to us when our glaring faults are thus held up to our face; and a code considerately sent to us, not to follow, but for us to profit by in applying its good points for the substitution of our bad ones. The task is a heavy one wherever it may fall, but we ought to feel indebted to Mr. Ernest Emil Wendt for expressing so much good will towards us, and taking the trouble to give us a translation of the laws of his own country.

The work is comprised in a small octavo volume, filling less than 300 pages with a fair index for reference.

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 704, last Volume.)

Name.	Place.	Position.	F. or Fl.	Ht. in Ft.	Dist seen Mls	Remarks, Bearings are by Compass.
81. St. Thomas	W. Indies	Mohlenfels Bay	...	...	...	Light discontinued, damaged by Hurricane.
82. Monte Rosa	Lipari I.	38° 28'·7 N. 14° 57'·5 E.	F.	115	4	Est. 1st December. A *Red* Light, visible between W. ¾ S. and N. ½ E.; a guide to Casa Bianca
Finme Harbour	Adriatic	Mole Head	F.	26	7	Est. (?) instead of the present light
83. Sunken Rock	Off Sardinia	On S.W. Coast	...	...	...	See Note (*a*).
84. Singapore Rock	Tsugar Strait	41° 36' N. 140° 57'·3 E.	...	...	...	See Note (*b*).
85. Bristol	Channel	Buoys	...	...	...	See Note (*c*).
Flatholm and Usk	Lights	... ...	...	...	...	See Note (*d*).
86. Perim	Cambay Gulf	21° 35'·9 N. 72° 23'·6 E.	(?)	128	17	
Tapti, Surat R. mouth	Ditto	... ...	(?)	100	15	
87. Valdivia	Pt. Niebla Fort	39° 52'·2 S. 73° 24'·8 W.	F.	...	...	It is not fixed and flashing as before reported.
88. Indore Rock	Annesley B.	Red Sea	...	...	...	See Note (*e*).
89. Forest King Shoal	Off Monte Video	... ...	...	...	...	See Note (*f*).

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

(a) Reported Danger on the South-west Coast of Sardinia.—A sunken rock has been reported, by a coral fisher, in the track of vessels between the island of St. Antioch and Toro, south-west coast of Sardinia. The rock is about 30 yards in extent, with 17 feet water on it. Its position is about 4½ miles from the extreme point (Point Sperone) of the island of St. Antioch, and N. by W. ⅔ W. 5 miles from Toro islet. This approximate position being directly in the track of vessels passing within Toro, mariners are cautioned in using that passage.

Bearings Magnetic. Variation 14° *Westerly in* 1867.

(b) Sunken Rock in the Strait of Tsugar, Japan.—The Peninsula and Oriental Company's Steam Ship *Singapore* on her voyage from Yokohama

to Hakodadi, on the 20th September, 1867, struck on a rock, not hitherto known, off Toriwi-saki, in the strait of Tsugar, and was totally lost. This rock, now named the *Singapore rock*, is said to bear N. by E. ½ E., distant 2½ miles from Low island, or 3 miles N. by E. from Toriwi-saki. Mariners, therefore, are warned to use caution in approaching Toriwi-saki.

Bearings Magnetic. Variation 2° 40′ *Westerly in* 1867.

(c) Alteration in Buoys and Lights in the Bristol Channel.—The following alterations have been made in the buoys of the Bristol Channel:—

Ranie Spit Buoy is now *black and white* in vertical stripes.

West Cardiff Buoy is now surmounted by a staff and ball.

Cardiff Hook Buoy is now *black.*

East Cardiff Buoy is now a conical buoy, with staff and ball, and is *black.*

Nash Swatchway Buoy is now *black and white* in vertical stripes.

Breaksea Buoy is now *chequered black and white.*

Wolves Buoy is now *red.*

West Culver Buoy is now a conical buoy, with staff and triangle, and *black and white* in horizontal bands.

East Culver Buoy is now a conical buoy, with staff and diamond, and *red and white* in horizontal bands.

New Patch Buoy is now *red and white* in horizontal bands.

South-west Patch Buoy is now a conical buoy, with staff and diamond, and *red and white* in horizontal bands.

Welsh Hook Buoy is now *chequered red and white.*

West Usk Buoy is now *chequered red and white.*

East Usk Buoy is now *red.*

(d) Flatholm and Usk Lights.—The following alterations are to be made in the Flatholm and Usk lights.

Flatholm Light will be *red* from and between the bearings of S. ¼ E. and S.W.

Usk Light will be *red* from and between the bearings of N.W. ¾ W. and N.N.W. and also from N. by W. to N.N.E. ¼ E., from whence to the land it will be *white.* It will also show *white* between N.N.W. and N. by W. to mark the channel into the river, and a *white* strip will show up the river between the bearings S W. by W. ½ W. and W. by S. ¾ S. When these alterations have been made they will be notified.

Bearings Magnetic. Variation 22° *Westerly in* 1867.

(e) The Indore Rock.—It appears from a notice published by the H. O., Admiralty, that—The *Indore* steam transport has struck on a patch of coral rocks, about half a cable across, with 6 to 9 feet on it at low water, in a position E. ¼ S., 3¼ cables from East rock, between Dissee island and Hurtow Point; and now marked by a buoy with staff and cross-boards. The channel into Annesley bay, between Indore and East rocks, deepens gradually to 17 fathoms near the latter.

DIRECTIONS.—Vessels entering the bay passing on either side of Centre rock, and leaving East rock on the starboard-hand, may then pass between it and the Indore buoy, clear of all danger; or after passing the Centre rock they may stand over to the eastern shore, and go inshore of the Indore buoy. A buoy which has 6 fathoms outside of it has also been placed on the outer end of a spit projecting from the west shore of Annesley bay, at about 3 miles northward of the anchorage.

Bearings Magnetic Variation 4° 40′ *Westerly in* 1867.

(f) The Forest King Shoal, near Monte Video.—The English Merchant Ship *Forest King* has grounded on a rocky patch of 7 feet water between Brava and Buceo points, the following bearings were obtained from the patch:—

Pipas rocks	..	..	..	N.E.;
Flores lighthouse	..	..	..	E. ¼ S.; and
Luz rocks	..	..	..	N.W.;

and indicate the danger to be 1¾ miles from the land and 6 miles from Flores lighthouse. As this part of the eastern approaches to Monte Video is known to be doubtful ground, mariners are warned to give the land in the neighbourhood a wide berth.

All Bearings are Magnetic. Variation 9° Easterly in 1867.

NEW ZEALAND. NOTICE No. 2.—Captain H. W. Hope (H.M.S. *Brisk*) on anchorages and rivers on the East and West coast of the Middle island, New Zealand, and ports in Cook Strait, 1867.

The town of Hokitika, it is stated, now numbers about 7,000 people, Greymouth about 3,000, and the whole population of the West coast is at present estimated at from 40,000 to 50,000 colonists. In 1850 no European resided on the whole line of coast.

MIDDLE ISLAND—WEST COAST.—*Martin's Bay*, in 44° 20 S. The Kaduku or Hollyford river, from Lake Kakapo or McKerrow, falls into this bay, being navigable for small craft to the lake, and there being an easy pass of only 1,400 feet above the sea between it and the great lake Wakatipa (the N.W. extreme of the Otago gold fields), perhaps ere long the river will become a haven of importance, as it is reported capable of improvement.

Taumaki, or Open Bay Islands.—Some rocks are discovered near these islands, and as steamers frequently pass inside of them, caution is necessary, until those dangers have been explored and placed on the chart.

The *Lyttelton Times* gives the following directions for an anchorage under these islands:—

"Captain Kerley in the *Bruce* has found it necessary to take shelter in the anchorage under Open bay islets. He considers it sheltered from all quarters, and may be safely used by any vessel. It is under the East side of the main island, from the North point of which a reef of rocks projecting towards the mainland, forms an excellent breakwater in heavy seas from N. and N.E. Another reef to the South breaks the force of a S. and S.W. sea. A rapid current ran S. past the island whilst the *Bruce* remained there, between three and four miles an hour."

Bruce Bay, in lat. 43° 36′ S., is the bay shown in the Admiralty chart between Makawiho and Poraugirangi points, resembling Jackson bay, though smaller. Anchor close under the S. head, in 3 fathoms water, with hard speckled sand apparently good holding ground; sheltered from all southerly winds. The S. head a bold rocky promontory stretching out a mile and a half to N.W. forms the shelter, and in the adjoining bay to the southward the same headland affords protection from the only winds to which Bruce bay is exposed. The vicinity of Bruce bay to Haast river and the gold diggings renders its shelter important. Haast river has a navigable entrance for small vessels.

Okarito Lagoon, into which Okarito river falls on its eastern side, is about 30 miles S. of Wanganui river. It is a tidal harbour with a strong flow and ebb; the flood still runs in for an hour after high water in the offing. It is high water, full and change, 11h. 40m., range about 9 feet. It has 14 feet over the bar at high water springs; at present the channel lies N.W. and S.E. Vessels entering should keep well to the South shore until abreast the North spit, and then stand across for the opposite side to avoid the current setting on a middle shingle bank.

About a quarter of a mile from the entrance the channel is divided by an island into two, the northern one navigable for about two miles, with 4 to 6 feet at low water, the southern branch with the same depth to about two cables length.

The holding ground is very bad, no trust in anchors and cables in the tideway.

A signal mast shews the same signals as those in use at the Grey and Hokitika rivers, and a *green* light at night to distinguish it from the bright light at Greymouth and the red light at Hokitika. This light enables vessels off the port at night to keep their position under sail instead of anchoring on the rocky bottom of bad holding ground.

The coast North of Okarito for 6 miles is a low sandy bank covered with coarse grass and flax, and about half a mile to the southward of it is a high rocky headland having a foul bottom N.W. of some distance.

Hokitika River, in 42° 45′ S., 170° 57′ East, may be used by vessels of a light draught to one and a half miles within the entrance, but the bar is so constantly shifting, and as no directions for entering could be depended on, local pilotage is only reliable. There is anchorage at 2 or 3 miles off its mouth in 8 to 10 fathoms, with good holding ground.

Vessels intending to enter must anchor for daylight or high water, and should do so a little to the southward of the port, for although the current sets southerly in the offing, a strong northerly set will often be found within the break on the bar.

A heavy western swell prevails on this portion of the coast; and although the prevailing gales come from N.W., S.W., and S.E., enabling vessels to lay well off shore for an offing; the weather should be carefully watched, and if threatening, the vessel should put to sea in good time.

The heaviest break off Hokitika is just outside the bar, in 2 fathoms water; the bar is always shifting its direction; after a heavy fresh, the river stream sets directly seaward, and in moderate or fine weather the sea throws up either the northern or southern spit, forming a series of middle banks intersected by channels of 12 to 18 inches only at low water.

Tides.—It is high water, full and change, at Hokitika bar, at 9h. 39m., and the mean rise from 8½ to 9 feet.

Grey River, the mouth in 42° 28′ S., 171 12′ E., like all the other rivers on the West coast, has a shifting bar, rendering local pilotage necessary. After a heavy fresh, when the channel breaks straight out West, it is safe of access for vessels of 8 or 9 feet draft, but when there is no fresh the channel inclines either to the North or the South, keeping first nearly parallel with the coast line, making the entrance of the Grey far more dangerous than that of the Hokitika river, because, when crossing the bar the sea takes the vessel on the beam when unless in command with very small helm she is in danger of being stranded on the beach before attaining a position to keep away for the narrow but deep entrance of the river.

Tides.—It is high water, full and change, at 10h. 15m.

Wanganui River is 42 miles southward of the Hokitika, with a narrow mouth unsafe for all vessels; the South spit overlaps the mouth, and any vessel attempting the bar, would become a wreck.

The coast between Wanganui and Okarito should be approached with caution, as the headlands have rocks off them, distance unknown.

Buller River is said to be the most easily navigable on the West coast, having more water on its bar, and being sheltered from the prevailing S.W. swell by Cape Foulwind. A large township, Westport, has been formed at the mouth of this river.

Between Cape Foulwind and the Buller River there is probably good anchorage in the bay, and shelter from southerly and south-west winds.

All vessels trading to the West coast rivers should have good hawsers and a spare anchor.

COOK STRAIT.—*Nelson* roads and haven have been lately buoyed afresh, but the channel into the haven is so narrow, the turn so sharp, and the tides so strong, that its safe navigation depends entirely on the skill of the pilot, and no directions could be used by a stranger.

French Pass.—A *white* buoy has been placed on the N.E. edge of the Middle bank; facilitating the navigation of the channel. Notwithstanding that the French pass is constantly used by the mail and coasting steamers between Nelson, Picton, and Wellington, they never pass through it against the tide, always then going round D'Urville island. Considering the eddying nature of the currents, it is dangerous to attempt to go through it against the tide, as a very slight sheer would run the vessel aground in a moment; but at slack water or with the tide a steam-vessel properly managed has nothing to fear.

Queen Charlotte Sound.—A *black* buoy now marks the position of Luke rock, off Fly bay;—and a *red* buoy marks the position of a rock with 10 or 12 feet water over it, about half a mile off the S.W. end of Pig island.

The town of Picton now stands on the spot, marked on the chart as the native village of Waitohi.

There is excellent anchorage in Waitohi bay, with deep water close to the shores.

MIDDLE ISLAND—EAST COAST.—*Otago Harbour* is now called Port Chalmers. Otago being the general name of the province.

Two beacons have been placed on Blackhead, within the entrance; kept in one they lead across the bar, and up to the anchorage inside Harrington point.

Bluff Harbour.—The entrance has been buoyed, as well as the harbour itself, which is frequented by the mail steamer.

Sailing Directions for Bluff harbour, by Mr. Thomson, Harbour Master. —"Vessels from the eastward, intending to enter by the North passage, should steer for the sandy point about 3 miles eastward of the harbour, to about half a mile off shore, when a black buoy will be seen, which marks the north-east end of the sand spit. In moderate weather the pilot will board here, but in his absence keep along the land about W. by N., leaving the buoys on the port hand, pass a cable off Tewaewae rock (the eastern extremity of North head, about 10 feet above water and hold close to), and steer across for a large rock on the beach of the western shore with

a white patch on it, off which the pilot can board in any weather. Vessels drawing over 16 feet should not take this passage at or near low water.

"Vessels from the eastward taking the passage between Dog island and the sands should give the island a berth of half a mile, and steer about West for Lookout point until Starling point bears North, then steer in to pass about 1½ cables off Starling point, leaving the buoys on the starboard hand, and when abreast of the point the pilot boat should be seen.

"The best time for a large steamer or a sailing vessel with a fair wind to enter is at high water or first quarter ebb; but sailing vessels during westerly winds should be at the heads at half flood.

"Entering by either channel, leave the red buoys on the starboard hand, and the black, on the port."

Ruapuke Island.—The channel between Hazelburgh group and South islets appears clear of danger, no soundings could be found with the hand lead. In hauling into Henrietta bay from the southward the islets at its southern entrance should not be passed too close, as the rocky patch on the north side of these islets appears to extend further to the N.W. than the chart shews.

There is a considerable native village at the S.E. angle of Henrietta bay, and a well-sheltered landing place on the sandy beach.

WRECK OF THE BOSPHORUS TRANSPORT ON HER WAY TO CALCUTTA

Appears in the Port Elizabeth Telegraph, Africa.

ON Saturday, October 19, no coals being procurable at Simon's Town, the *Bosphorus*, after a splendid passage out from Liverpool, left that port for this for the purpose of taking in coals to bring her on to Bombay, from whence she was to be despatched by the Indian government with supplies to the base of operations of the expedition despatched against Theodorus, of Abyssinia. On Saturday all was fair sailing, and the ship with her great steaming qualities soon lessened the distance between her and this port. Early on Sunday, however, a change in the barometer indicated that it was not to be all plain sailing, that a wind was rising, probably a gale coming on, which was but too truly verified as the day wore on, for it blew with tremendous violence from the S.S.W., the sea rising mountains high, and tossing the ship like a cork upon the now angry but buoyant waters. On, however, she careered, ploughing amain, until the pall of night gradually covered the face of heaven, when a lull took place in the storm, and by degrees the wind abated, leaving behind a tremendously high sea running. On, on she kept, riding her way amid the thick darkness that prevailed, all on board unaware of the danger other than that threatened by the storm, when at about one o'clock in the morning, the ship going at full speed, a terrible collision took place that

made her reel and stagger again with what was at first unknown, but gradually the conviction grew upom them that they had been hugging the coast too closely and had struck upon a reef of rocks. The order to "back" was given, but nothing but a dull grating sound could be heard, and the ship remained immoveable.

The most terrible anxiety reigned on board as to the nature of the catastrophe which had befallen them; but, notwithstanding, all was order and obedience, and the voices of the captain and officers, as they gave their orders, were distinctly heard, and their wishes as promptly executed. The sea was now running very high, and the rumbling and roaring of boiling surf, as it thundered against the barrier that opposed its progress, was but too well heard by all. In order to ascertain their exact position, as well as distance from the land, a boat with the proper complement of men was at once lowered, but scarcely had it touched the water when it was taken upon the crest of a huge wave and capsized, the men with the greatest difficulty making their way to the ship, where they landed safely on board. Effort after effort was again made, but with the like result, until at last, after three weary hours, a worse calamity stared them in the face. The ship was gradually beginning to break up, and all once split up the centre, a number of the engineers, stewards, and stokers being engulfed between. Others got on the starboard quarter, and sank with the hull, to rise no more; while the remainder of the crew, some on pieces of improvised raft, others on portions of the wreck, made their way to the shore, where they lay exhausted, naked, cut, torn, and lacerated by the sharp rocks with which they came in contact, the captain, like a brave English sailor, being the last to leave the wreck, having stood fast to his ship while a life could be saved; and then committing himself to the boiling sea, unable to swim, and weakened from over-exertion, he battled manfully from raft to raft until he at last reached the shore in safety.

There they stayed until daylight dawned, when all the horrors of the scene were realised in their fullest intensity. In front of them lay their late noble ship, smashed to pieces, made the sport of the waves as they leaped and dashed over her now sunken hull. Around them was nothing but a rocky, iron-bound coast, no human habitation within ken, not a patch of vegetation to relieve the monotony of the scene; while torn, lacerated, without clothes or food, they knew not whither to bend their steps to relieve their sore and pressing wants. Some, however, as the morning advanced, made their way inland, and having espied a lad on horseback, hailed him, and having told him their necessities, he at once guided them to the farm of Mr. Moulman, whither the rest followed, and everything that could be done to relieve their sufferings and help them on to Humansdorp was cordially done. The civil commissioner of Humansdorp was at once made acquainted with the calamity, and as fast as fleet horses could bring him to the scene he was there to render any possible assistance.

Their entry into Humansdorp was a melancholy spectacle. As we before stated, most of the men landed without any clothes, but having

secured towels, sheets, etc., that washed up from the wreck, they wrapped them round their loins, and in this pitiable plight they entered the village on Tuesday evening, the captain having arrived there the morning of the same day. On the following day the waggons with the crew left for this place, where they arrived this morning, presenting a spectacle somewhat similar to that witnessed some five months ago, when the crew of the *Osprey* were conveyed here, but infinitely more saddening, as 48 valuable lives (about one-half of the crew) have been lost, and a deep, settled gloom will thus be cast over many a happy homestead deprived by the rude waves of its help and stay; while the countenances of the survivors bore the impress of deep-felt sorrow at the loss they had sustained in their brave comrades.

Zitzekamma Point, the scene of this dire calamity, is situated about fifteen miles west of where the *Osprey* struck, and has been oft-times the scene of many a similar catastrophe, though perhaps not so dire in their results as the present. On its dangerous and unmarked reef the *Runnymede*, some years ago, became a total wreck, while within the last fifteen or twenty years over a dozen vessels have met with a similar fate. It is a locality pregnant with shipping disasters, its low table-land surface tending to deceive the eye, while its projection to an extent farther than is marked, and its low reach of rocks beyond again, as well as the force and variation of the currents along the line of coast, which are at best but imperfectly known, have, alas! afforded too many facilities for such mishaps. It has indeed proved to be the Scylla and Charybdis of our coast, and we think it is the bounden duty of the authorities to recommend the erection of a lighthouse in order that calamities of a like nature may be avoided for the future. The frequent occurrences of shipwreck and loss of life along its margin calls for such a provision, and we hope that a structure so necessary and desirable will before long rear its warning head above the Point.

We have been furnished with a correct list of the names of those who were drowned, as follows:

DROWNED.

Sailing Department.

John Leigh, able seaman		Wm. Nixon, ordinary seaman	
Frank Downden	do.	John Murphy	do.
Robert Fleetwood	do.	Jos. Maybrick	do.
Tim. Palmer	do.	Jos. Stephens	do.
Christian Dick	do.	Frank Ross	do.
J. Tasked	do.	Henry Hutton	do.
James Hopkins	do.	Goes Alfred	do.
John Pye	do.	John Engon	do.
William Elder	do.	John Eyre	do.
Wm. Davidson	do.	John Webster	do.
Wm. Tayler	do.	John Morgan	do.
— Bates (boy)		— Ward	do.
— Griffin (boy)			

Engineer's Department.

Robt. Storm,	chief engineer.	John Clark,	fireman.
John Martin,	2nd do.	Peter Holson	do.
David Reid	3rd do.	Owen Drummond	do.
Geo. Wilson	4th do.	Th. Peycock,	trimmer.
John Ninon,	fireman.	Thos. Sherlock,	do.
Pat. Connelly,	do.	Peter Clark,	do.
G. Shaw,	do.	Daniel Linn,	do.

Steward's Department.

Geo. Rae, chief steward	John Hunt, steward
W. Avery, second do.	Thos. Payne, do.
Thos. Rissack, clerk	Chas. Jenkins, cook
T. Wilkinson, storekeeper	— Brown, ditto
Staunton Breard, steward	Thos. Shallavay, baker.

Twenty bodies have been recovered and buried on the beach near the scene of the wreck. Two of them were identified; one being that of Mr. Storm, the chief engineer, and the other that of Mr. Wilkinson, the storekeeper. The survivors of the crew are in a very distressed condition, having lost the whole of their clothing and effects. A subscription list on their behalf is lying at the shipping office, contributions to which will be thankfully accepted.

(From the *Cape Argus*, Nov. 5.)

PORT ELIZABETH, Nov. 4.

The Court of Enquiry into the circumstances attending the loss of the Bosphorus gave judgment this morning. Captain Alexander absolved from blame. Court of opinion that disaster is attributable to the strong current which generally runs to the westward after fresh westerly gales, as well as to the existence of a north-easterly current, which sets directly on to the shore from Formosa Point to Cape Recif, between the Agulhas current and the coast, and which was unknown to the said master, not being stated upon the chart by which he was sailing.

Notes on Novelties.

Among our "Novelty Papers" of current events, at home and abroad, of which we have a motley collection, we shall first record a few gratifying words attributed to the First Lord of the Admiralty at the annual banquet of the Lord Mayor, and which we were prevented from noticing in our last number. In reference to the Navy, The Right Hon. T. L. Corry is reported to have said:—

"During the cruise last September of the Channel Fleet it put into Plymouth for two days only. Such is the confidence now entertained in the men composing the crews of our ships, that general leave was

given, the day before the fleet sailed, to remain on shore for the night. In the morning, when the ships got under way, only four men were absent, and it turned out that the cause of the absence of three of those men was that their boat was unfortunately capsizec, happily without any loss of life, and had so prevented their return to the ship. (Cheers.) I think this fact is the strongest illustration that could be afforded not only of the high state of discipline of the Navy, but also of the contentment and *esprit de corps* existing among the men serving on board her Majesty's ships. (Hear, hear.) Whilst we have this good reason to congratulate ourselves, and to say that whether in spirit or in discipline the Navy was never more complete than at present, or more fit to meet any emergency, I am sure you will all join with me in the earnest hope that the peace which now subsists among the civilised nations of the world may long remain undisturbed. (Hear, hear.) I cannot refer to this topic without giving expression to the gratification I have felt in the recent visit of an American squadron to our shores. An opportunity has been thus afforded for the most friendly and cordial intercourse on both sides between some of the most distinguished officers of our own Navy and the most illustrious of American sailors under their distinguished Admiral Farragut. I am happy to be able to state that the result of this intercouse has been to lead to the most agreeable impression being made on both the services. I sincerely trust that intercourse and friendship may tend to strengthen the feeling of good fellowship between two countries connected by ties of interest and blood. In the Abyssinian expedition I am sorry to say the Navy has but a very small share, and that which has fallen to it is principally to supply means of transport. All I can say is I hope that service may be well performed."

There can be little doubt of such a wish being verified, notwithstanding the nest of rocks that abound in the Red Sea of which we know but little, so little indeed that we can not produce a plan of Annesley Bay, the rendezvous where our troops are landed; we shall be fortunate to get clear of it without some mishap, but as far as caution and foresight can go, they will make up for our deficiency in the hydrography of the shores of Abyssinia. We seem indeed to know as little of them as we do of the country itself: and the reports that have hitherto reached us of proceedings quite justify our hopes that we shall do so.

Among foreign events, the first though not the most important that comes to our hand, is another instance where our deficiency of hydrographical information has been fatal to a fine steamer of the P. and O. Company.

"The Peninsular and Oriental Company's steamer *Singapore*, it will be remembered, on the 20th of August left Yokohama for Hakodadi and, almost within sight of her port, struck on a sunken rock not laid down in the charts, and went down in deep water in a little more than an hour. There were 25 passengers on board, connected chiefly with important mercantile houses in Japan and China, and a crew of 120

officers and men. 'The escape of every individual, without a single exception is due,' says the *Japan Times*, 'under God, to the admirable boat service universal on board the Peninsular and Oriental Company's ships, to the coolness and steadiness of the crew and passengers, and particularly to the watchful and unremitting care of Captain Wilkinson, his chief mate Mr. Reeves, and his other officers, which had kept the boats in the splendidly serviceable state in which they were found, and the crew under the discipline which did them such credit, *Every boat* was in the water *and all the passengers in the boats within six minutes after the ship had struck!*'

Hakodadi lies in a bay concealed by a headland from an island known as Low Island, lying about S.E. from it, on the other side of a strait some 14 miles broad. The danger which is now unfortunately known to us as the *Singapore rock*, is distant from Low Island about two miles and a half, bearing N. by E. ½ E. from it. It is a square pinnacle about 8 feet broad each way, and the Japanese know it by the name of Ki-ko-ra Iwa (rotten shell rock). The *Singapore* ran upon this at full speed, taking it just on the starboard bilge. The naval court was held at her Britannic Majesty's Consulate, Kanagawa, Sept. 9, to inquire into the loss. It was summoned by the Vice-Admiral, the Hon. Sir Henry Keppel, K.C.B., commander-in-chief. The court finds 'that the steamer *Singapore* was lost on the 20th August by striking upon a sunken rock unknown to European navigators, in the usual track of vessels making Hakodadi from the eastward, and that no blame attaches to Captain Wilkinson and the officers of the *Singapore* for the loss of the said ship, and the court desires to express its approbation of the celerity with which the boats were cleared away, and of the conduct of the captain, officers, and crew in remaining with the ship until the last moment.'"

We heartily congratulate Captain Wilkinson on the efficient state of his boats, by which, under providence, a greater calamity has been averted.

While we are in the Pacific and on Japanese shores, the unpleasant affair must not be lost sight of, the murder of two British seamen who seem most incautiously to have risked their lives to the ill feelings which might be expected to linger among the Japanese. The occurrence is thus related in the prints of the day:

"'The murder of two British seamen belonging to H.M.S. *Icarus*, at Nagasaki, has been warmly taken up by Sir H. Parkes and Sir H. Keppel. The *Japan Herald* of the 11th September says:—The visit of his Excellency Sir Harry Parkes, the British Minister, and Sir Henry Keppel, the British Admiral, secured that the matter should be very warmly taken up; and as the governor of Nagasaki was unable to discover the murderers, who were sailors belonging to the Prince of Tosa, both minister and admiral went to Osaca. Obtaining no definite satisfaction there, Sir Harry steamed off in H.M.S. *Basilisk* to Susaki, a port in the Prince of Tosa's territory, accompanied by Mr. Satow, an interpreter. He had been preceded three days by the Vice-Governor

Hirayama and other officers of the government. It was rumoured that if the *Basilisk* went in she would be fired upon by the forts, but this did not deter Sir Harry, and if there was any idea of the sort in the minds of Tosa's men, it was abandoned. At Susaki, the officers, passengers, and crew of a Japanese steamer belonging to Tosa, which left Nagasaki soon after the murder, were examined by Mr. Satow in the presence of the Tycoon's and Tosa's officers. This steamer has been sent to Nagasaki, where further investigations are to be conducted. Mr. Satow, as well as the Tycoon's officers, have also gone there. It is gratifying to receive the assurance that the greatest desire is evinced by Tosa's officers to discover the murderers, wherever they may be. The Governor of Nagasaki is to be replaced and the the garrison increased. It is understood that the unhappy affair is in good hands, and that Sir Harry Parkes will not let it drop without the most thorough investigation. Whilst Mr. Satow is carrying on his inquiries at Nagasaki, Sir Harry Parkes has returned in the *Basalisk*—having been preceded by the admiral about a week—the latter not having gone to Susaki. The motives for the murders that have led to all this trouble can hardly be doubted. The old feelings of hostiliity to foreigners are not rooted out in a day."

There can be no doubt that whatever the vigilance of our active Naval Commander-in-Chief can effect along with the energetic discrimination of our Consul, Sir Harry Parkes, if it be possible the perpretrators of this foul deed will be brought to punishment. But under all the circumstances, we are not so much surprised that such an event should occur in a barbarian land where the *Coniro* is a ready murderer for hire, as we are that any of our seamen should be allowed to be on shore all night. However this no doubt has been rectified, and doubtless one lesson (severe as it has been) will be enough to prevent the possibility of a recurrence of such cases.

An interesting episode in the transactions of States has just taken place in a part of the world washed by the Pacific. Our readers will remember the recent purchase by the Americans of *Russian America*, a territory extending from Sitka along the shore of the Pacific into the Asiatic Ocean. Here we have the certificate and completion of the whole affair—the transfer of *Russian America* to the United States is now a registered fact.

THE TRANSFER OF RUSSIAN AMERICA TO THE UNITED STATES.—The *New York Times* of the 13th contains the following:—"New Archangel, October, via Victoria, Sunday, November 10th, and Swinomish, W. I. Monday, November 11th. The formal transfer and delivery of Russian America to the United States government took place to-day, by Captain Pestrechoff, Acting Commissioner on behalf of the Russian government, and Major-General Rousseau on behalf of the United States. At 3 o'clock p.m. a battalion of the United States' troops, under command of Major Charles O. Wood, of the 9th infantry, was drawn up in line in front of the governor's residence, where the transfer took place. By 3.30 a large concourse of people had assembled,

comprised American, Russians of all classes, Creoles and Indians, all eager witnesses of the ceremonies.

Precisely at the last named hour the Russian forts and fleet fired salutes in honor of the lowering of the Russian flag; but the flag would not come down. In lowering it tore its entire width close by the halliards, and floated from the cross-trees, some 40 feet from the ground. Three Russian sailors then attempted to ascend the inch-and-a-half guy ropes supporting the flag-staff, but each failed to reach his national emblem. A fourth ascended in a boatswain's chair, seized the flag and threw it in a direction directly beneath him; but the motion of the wind carried it off, and caused sensation in every heart. Five minutes after the lowering of the Russian flag the Stars and Stripes went gracefully up, floating handsomely and free, Mr. George Lovell Rousseau having the honour of flinging the flag to the breeze, the United States' steamers Ossipee and Resaca at the same time honouriug the event by firing salutes.

As the Russian flag was lowered Captain Pestrechoff stepped forward and addressed General Rousseau as follows:—'General,—As commissioner of his Imperial Majesty the Emperor of Russia, I now transfer and deliver the territory of Russian America ceded by His Majesty to the United States.' General Rousseau, in response, as the American flag ascended, said:—'Captain,—As commissioner on behalf of the United States government, I receive and accept the same accordingly. The commissioners spoke in a tone of common conversation, and were only heard by Governor Makesatoff, General Jeff. Davis, Captain Kuskol, and a few others who formed the troupe. Several ladies witnessed the ceremonies, among them Princess Makesatoff, Mrs. General Davis, and Mrs. Major Wood. The Princess wept audibly as the Russian fing went down. The transfer was concluded in a purely diplomatic and business-like manner, neither bouquets nor speech-making followed. The entire transaction was concluded in a few hours, the Ossipee, with the commissioner on board, steaming into the harbour at 11 o'clock this forenoon, and at 4 o'clock in the afternoon a dozen American flags floated over the newly-born American city of Sitka.*

* It is stated that the Russian cession of this territory grew out of the following petition to the American Legislature. If so, it has been more than granted in the negotiation of the treaty concluded between the Uuited States and the Russian Government for the purchase of the Russian-American possessions:—

To His Excellency, Andrew Johnson, President of the United States,—Your memorialists, the Legislative Assembly of Washington Territory, beg leave to show that abundance of codfish, halibut, and salmon of excellent quality have been found along the shores of the Russian possessions. Your memorialists respectfully request your Excellency to obtain such rights and privileges of the Government of Russia as will enable our fishing vessels to visit the ports and harbours of its possessions, to the end that fuel, water, and provisions may be obtained, that our sick and disabled fishermen may obtain sanitary assistance, together with the privilege of curing fish and repairing vessels in need of repairs. Your memorialists further request that the Treasury Department be instructed to forward to the Collector of Customs of this (Puget Sound) district, such fishing

If we wanted a sample of progress in colonizing in point of utility to the parent no better could be found than San Francisco. Our American friends are busy in the Pacific. The line of steamers which they have established between San Francisco and China, touching, of course, at Japan, is said to be everything that can be desired. Of American Pacific steamers we preserve the following:—

The next steamer from San Francisco for Japan and China is appointed to leave on the 3rd September. The steamers of the West India and Pacific Steamship Company will convey freight and passengers from Liverpool, and the Royal Mail Company's steamers from Southampton for conveyance by this route. From the New York papers we learn that the steamship China—a sister ship to the Great Republic—had her trial trip on the 11th June. The vessel proceeded from New York about 30 miles to sea, and during the run easily attained 11 knots. The following is a sketch of the dimensions, etc., of the China:—Length between perpendiculars, 360 feet; length over all, 373 feet; breadth of beam, 46 feet; breadth of beam including outer planking, 47 feet 10 inches. She has three complete decks and an orlop deck, four watertight bulkheads fore and aft, floors of white oak, iron strapped inside of frame and outside of inner course of planking, being double planked from keel to the wales, and edgewise bolted in a most thorough manner. She is barque rigged, having fore and aft mainsails, topsails, and topgallantmasts. There is but one engine of 105-inch cylinder and 12 feet stroke, having cut-off and surface condensers. There are four tubular boilers with horizontal tubes, 24 furnaces, with independent circulating pump. The vessel possesses accommodation for 500 first and second-class passengers and 800 staerage. The means for saving life consist of 1,500 life-preservers, 12

licences, abstract journals and log books as will enable our hardy fishermen to obtain the bounties now provided and paid to the fishermen of the Atlantic States. Your memorialists finally pray your Excellency to supply such ships as may be spared from the Pacific naval fleet to explore and survey the fishing banks known to navigators to exist along the Pacific coast from the Cortes Banks to Behring's Straits; and, as in duty bound, your memorialists will ever pray, etc.

Passed the House of Representatives, January 10, 1866.

EDWARD ELDRIDGE,
Speaker of the House of Representatives.

Passed the Council January 13, 1866.

HARVEY K. HINES, President of the Council.

The petition is accompanied by the certificate of the secretary of the territory as to its being a true copy. The petition, it will be noticed, was passed more than a year ago, and is the foundation of the treaty. To which we may add,, *sic transit*, and our little pocket-piece of coast of seven degrees of latitude containing Vancouver's Island, is now hemmed in north and south, by Oregon and Arctic land extending round through Bhering Straits to near the mouth of the Mackenzie River.

The position of Vancouver's Island seems to be most unfortunate in reference to the support which it should receive, while it is really in the very midst of difficulty. It is far away, out of our reach: difficult to get at by land or sea; and, if we mistake not, is more likely to entail on us trouble and disappointment than to contribute anything to our solid advantage. Colonization doubtless has its benefits, but what benefits can Vancouver's Island confer upon us?

metallic lifeboats, and two liferafts. Her tonnage is 3,826 tons official measurement, and 5,009 tons builder's measurement. The China has been built by Mr. W. H. Webb, of New York, under the superintendence of Mr. W. W. Vanderbilt, the general manager of the Pacific Mail Company.

From San Francisco to Japan.—The Colorado completed her second return voyage from Yokohama to San Francisco in 19 days. The route is, to some extent, still undetermined. On the outward voyage the direct northerly route was attempted, but the weather was found stormy, and the course was changed for a more southerly one, and the same thing happened on the return. The distance from San Francisco ts Yokohama is 5,233 miles, but the adoption of a southerly course lengthens the route. At present the journey from New York *via* Panama, the Isthmus railroad, and so to San Francisco, thence to Yokomama, and then on to Hong Kong (1,645 miles further), making in all 12,139 miles, is reduced to six and a half weeks. Fifteen days at least may be deducted from this when the Pacific railroad is finished, and then Hong Kong, though more than 8,000 miles apart will be within 30 days from each other. Add nine days to Liverpool, and see which will be the route from England to the East a year or two hence. Keen men of business are preparing for it.

And another long since formed by them between San Francisco and Panama, connects that thriving part of the world at once with the States on the shores of the Atlantic until the great central railway across the Continent is completed, an event which it is anticipated will take place in two or three years. Our American friends in the Pacific find that submarine electric cables are no less wanted there than they were in the Atlantic, and American enterprise has for some years been busy in finding the proper bed for a cable, and the depth it will have to be laid in. Our last number throws some light on this subject, as well as the island which it is possible may become the coaling station for the steamers to China. It is said at the Sandwich Islands that Middlebrook Island is its name, and we have received the following remarks on the subject that may prove interesting to some readers.

There is no doubt that the American-China Mail Company design making a coal depôt at the above named Island, where the schooner *Milton Badger* and the United States steamer *Lockawanna* have gone. So far as the harbour is concerned, there can be no doubt of its availability for the purpose. But there are other things which should be taken into consideration in selecting a depôt for large steamers. There are of course no wharf facilities for landing and taking off coal, and it can only be done by the slow mode of lighters or by constructing one or more wharves. This is practicable, but it will only be at great expense, for, besides a wharf, there must be erected various buildings for the use of agent and labourers.

Besides this the Island is low, only 35 or 40 feet high, with strong currents generally prevailing around it, which make it unsafe to approach, and almost impossible to enter its harbour at night, while it can seldom be seen over six miles off in a clear day.

But the most important objection is its location, directly in the centre where the cyclones of the Pacific culminate. These cyclones, which prevail almost every winter, mostly in December and January, culminate between the latitudes of 27° and 30° north, and between longitudes 160°, east and 160° west. It is only within these limits that the terrific hurricanes of the Central Pacific are encountered. Generally south of 27° vessels are comparatively safe at all seasons. The proposed depôt lies in *the most dangerous position that could be selected*, and the Company ought not to assume such risks as it will in locating a depôt there.

Now contrast the advantages of the port of Honolulu. It lies in the safest track across the Pacific that is known. It has ample wharves, foundries, workshops, and ship-yards, to meet any emergency that may arise, even to making a steamship when ordered. Middlebrook Island is a barren sand pit with no vegetation, trade or population; while here abundance of water, fruit, travel and trade invite the steamers to touch. There can be no comparison between the two places, while the risks assumed in selecting Middlebrook Island as a depôt are immensely great. The Company may go on perhaps in its plans till some serious accident compels it to realise the fact, and to abandon the wild chimera.

These are objections in the foregoing brought forward by the advocates of the Sandwich islands that are formidable enough, and we shall not be surprised at seeing another site chosen. But it may be doubted whether a more convenient midway position could be found.

We said San Francisco was a good specimen of American enterprise. Here is a picture of it dated about one year ago :—

San Francisco capitalists are rapidly developing the interests of that port and making it, in its facilities for accommodating the commerce of this ocean, equal to any of the Atlantic ports. Every year we hear of some new project. It has long had marine railways for repairing ships, and now a contract has been closed for constructing a dry dock at Hunter's Point, some three or four miles South of the city. Like most of the enterprises which her citizens plan, this is to be on a gigantic scale, and is to be the largest stone dry dock in the world, with capacity to dock the largest vessel afloat except the *Great Eastern*.

It will be 400 feet long in the clear, 100 feet wide at the top. 60 feet wide at the bottom, and 30 feet in perpendicular depth. The dock will open into the bay, and will be closed by a floating gate—an iron boat, which, when filled with water, will sink across the mouth of the dock, the keel and projections at the ends fitting into grooves, thus effectually closing the dock, so that the water can be punped out. By letting the water into the dock and partly emptying the gate, it will rise, and being longer at the top than at the bottom, soon floats out of the groove, and can then be towed out of the dock to let vessels enter or leave. The water in front of the point is sufficiently deep to float any vessel. The direction of the dock will be north-east and south-west, so that it will not be affected by storms. The banks of

the dock are to be five feet above high water. The contract price for the job is 250,000 dollars and the contractors expect to finish the work within a year, Their men are at work, and much has already been done. The other improvements, including a bulk head, workshops, and machinery, will cost 100,000 dollars or 250,000 dollars. The steam pump will have a capacity to pump out the dock in two hours, and will be driven by a steam engine, with a fly wheel thirty feet in diameter and fifteen tons in weight.

Again on the subject of Mare island.—A Californian paper gives an account of the island on which is situated the navy yard at San Francisco. Mare Island contains about 750 acres of land—one-third of which is occupied with the improvements, the remainder is cultivated. The vessels now at the yard are the monitors Monadnock and Camanche, and the sloops of war St Mary's and Cyane. The number of men now employed will reach 500. The actual expenses approximate to 150,000 dollars per month, which is about equally divided in the purchase of material, and in the payment of labour. Commodore T. T. Craven is the commandant of the yard.

When it is considered that San Francisco will ere long be in direct communication with the Eastern States of the Union we need not be surprised at the great importance attaching to a place which is already the principal naval arsenal of the Pacific, and in point of magnitude as this rail will surpass all others, so in point of accommodation for travellers it appears to be unequalled by any other.

The following statement of the progress of the *Overland American Railroad* is dated in August last :—

The California papers promise to have the road completed from San Francisco to over and beyond the summit of the Sierra Nevadas by the first of October next—a distance from Sacramento of at least 120 miles over the most difficult portion of this end of the route. At the other end of the route, we notice that the telegraph reports that 385 miles are completed west of Omaha, and probably at this writing (August 9) over 400 miles are finished west of the Missouri River, which leaves less than 1500 miles intervening between the two ends. This will be constructed before January 1870, without a doubt. A great improvement has been introduced, by which railroad travelling is to be made as comfortable as by steamer. This is the introduction of the Hotel Car, fitted with sitting room, parlour, dining room and kitchen, and at night the whole is transferred into a sleeping car, divided off into apartments with berths, &c. A Congressional party recently went from Philadelphia to the western terminus of railroad travel 385 miles west of Omaho, in one of these Hotel Cars, without a change of car, furnished with meals and every luxury required including *baths*. A late *Bulletin*, commenting on this improved mode of travel says ;—

" It appears from a recent telegraphic despatch, that the Pacific Railroad is likely to draw to it all the improvements which have ever been made in railway travelling. Besides sleeping apartments, a thing indispensable on so long a route, there will be the hotel on wheels. The commissary travels with the modern caravan and furnishes the

"cakes and ale." The hard angularities of railway travel will be handsomely rounded off, when, after a night's sleep, the traveller has an opportunity to cleanse his hands and face, a luxury often coveted more than all else, and then, sits down to his breakfast without any of the ten minute rule. If any one wishes Pi-Ute entertainment in the wilderness, no doubt the traditional bacon and hard tack can be found, and something stronger than spring water. But most travellers will make friends of the commissary who knows how to keep a hotel. It is well that all these wants are to be anticipated.

The hard, bald ride over mountains and deserts, with chance accommodations by the way, would be too unattractive to divert in many instances, travellers from the more sumptuously furnished steamers. There can of course, be no competition on the two lines of travel in the matter of time. But in comfort and safety, there will be room for honest competition. The opening of the continental railroad will work no discontinuonce of the steamship line by way of Panama. Many will prefer the old route, with all conveniences, over the shorter and possibly more expensive land route. But this movement to transfer the substantial comforts of the steamship to the railway car, is an indication not only of the radical improvement being made in land travelling, but of the strong efforts about to be made to control the passenger traffic heretofore confined to the Panama route. Some of the most important inventions have recently been added to railway cars, and it now appears that our countrymen are to meet another of the great wants of the age by supplying a complete hotel on wheels. It is fitting that the greatest railway of modern times should combine every comfort which the ingenuity of the age can suggest."

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

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CATALOGUE OF ADMIRALTY CHARTS AND BOOKS. Edited and revised by Commander Dunsterville, R.N., to 1868. 3s.

EDWARD DUNSTERVILLE, *Commander, R.N.*
Hydrographic Office, Admiralty, 20th December, 1867.

TO CORRESPONDENTS.

OUR best thanks are due for our Liverpool contribution.

The Dartmouth letter in our next.

A Nautical Notice, No. 90, stating that the USHINISH LIGHT, on the East Coast of *South Kist* is a fixed RED light, and not a fixed white one.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

FEBRUARY, 1868.

The Indian and Atlantic Telegraphs.

It is now just three years since some interesting particulars appeared in this journal concerning our Indian electric telegraph. Say what we may of it, we cannot find that it is yet very successful. And it may be doubted with much reason, considering the territories, or even the seas through which it has to pass, that it really ever is to be free from difficulty of some kind. Yet, of the two routes, the one by sea, and the other by land, looking at all the obstacles to be surmounted in each, those of the former appear to be after all the most insurmountable. Political difficulties may to all appearance be removed, and all may appear smooth and easy (a state of things which we much doubt will ever be achieved); but how long will they remain so. We may reasonably ask what is more unstable than some special condition of political matters, which may be overturned at the caprice of even a petty power, and managed as appears it must be by indigenous officials. what guarantee can there possibly be for their honesty? Even should this particular be safe, what mischief can be done by translation, distortions, errors from accidental or wilful causes to mar the whole matter, which causes themselves may be even aggravated by the supposed despatch which all telegraph messages imply.

Now, if we take the bed of the sea for that of the electric wire, the Atlantic cable is at once a proof of what can be done. Messages from this country to the United States are safe as far as Newfoundland; but after Bull's bay come a variety of stations before arriving at New York, among which they become mutilated and sometimes converted into nonsense. The late news about the earthquake at St. Thomas and Tortola is an instance. But if the annals of electric telegraphy were consulted with a view to shew the mutilations of words, some very curious results would be laid bare. And yet the officials on the Atlantic line are all English (not scholars perhaps), who, at all events,

understand their mother tongue. Yet where the officials are not English, which is the case on the Indian land line, French, perhaps German, Turkish and perhaps Indian, it is no matter of surprise that such paragraphs as the following are going about in the papers even of these days :—

The complaints respecting the working of the Indian telegraph do not abate. Delay is not the worst part of the mismanagement. The messages, when they do arrive, are frequently utter nonsense. The errors in transmission are ascribed to the obstinacy of the Turkish Government, which refuses to employ a sufficient number of competent clerks. Not long since a gallant young officer in one of the Hill stations made a proposal of marriage to a charming girl. The young lady was willing; so was papa, on one condition—namely, that the suitor should obtain his father's consent. Of course the lover would not submit to the delay that must have occurred if he had waited for an answer from England by post. He telegraphed home, and received in reply a message wholly unintelligible. There was not one word of sense from beginning to end. The young man did what most lovers would have done under the circumstances—took the message as read, considered that the consent had been given, and won his bride. There was not much harm done in this case; in others the failure might be a very serious matter. Another abuse has just been discovered in connection with the Indian telegraph. Mr. Glass, the well-known telegraphic cable constructor, asserts that all messages sent by the Government in England to the Government in India are copied out in Paris and sent to the French Government, which files them. Clearly, if this is the case, we ought to be independent of land routes, and we ought to consider very seriously if the proposed line from Falmouth to Gibraltar and thence to Sicily ought not to be proceeded with at once.

No doubt the gallant young officer above alluded to was right in cutting the gordian knot of telegraphic difficulty in order that the marriage knot might be at once tied. But what of Mr. Glass's information? Surely that is a state of things that on occasions might render the very idea of the electric telegraph most objectionable.

There can be no doubt that the intervention of foreign officials of all kinds is an all powerful antidote against the use of the electric cable. But where the sea bed can be used, and English officials employed, there only may the duties of a line be guaranteed from such bungling work as reported of the Indian lines. Doubtless, the sea too has its difficulties. The Atlantic Cable Company found them to their cost. But after all they were overcome, and why should they not be overcome on the Indian line. True, there is deep water and foul bottom. The latter particularly to be avoided in the Red Sea. Sooner or later if the line to India is to be a serviceable line, such a line as it ought to be, they will have to be avoided, and apathy and sluggishness, of all kinds in those who should attend to it, must not be allowed to remain as obstacles to its establishment. The sea is our only independent medium;—independent of those two evils which come of such servants as are alluded to in the foregoing paragraph. But we have met with

some account of this Indian line; and the reason why it is spoken so badly of is quite evident in its perusal.

In our February number of 1865, we gave some particulars from a letter which was considerately placed at our disposal, and which referred to the Kurrachee end of it. In the following our readers will find some general particulars which will shew the terrible ordeal through which all messages have to pass, and the utter hopelessness of their progress ever undergoing improvement.

For establishing a line of electric telegraph between England and India there was the choice of two routes, one by Constantinople and the Gulf of Persia, and the other by Egypt and the Red Sea. Political considerations in this matter were of the first moment and certainly in favour of the latter of these routes. There were several European stations already on it, and traversed over by mail lines already established there. A submarine telegraphic line was laid down in 1859-60 from Suez to Kurrachee by a company to which Government had guaranteed a grant. This enterprise was unfortunate; for several months no messages could be sent by it. The form of the cable was not what it should have been, and there were untoward obstacles in laying it, so much so that the interruptions led to its final abandonment.

This check in the progress of marine telegraphy was attributed in some measure also to want of experience in those conducting the laying down of the cable, and in consequence the Indian government resolved to employ only its own engineers. A company, a mere electrical staff, taking an important part in so difficult an operation appeared to be all wrong and not entitled to confidence. Meantime an officer of the Indian army, Colonel Stewart, was entrusted with an exploring commission on the subject. He examined the Meckran coast, that of the Persian Gulf, and Asiatic Turkey, from Busorah to Constantinople. On his return, according to the favourable reports which he made, it was decided to construct a new line through these parts, and to Colonel Stewart was entrusted the general superintendance of the work. To Sir Charles Bright and Mr. Latimer Clark, two engineers who had given their special attention to the subject, was assigned the charge of having the cable constructed, and carrying through the work of laying it down. The advantage of taking this route for the cable could not be appreciated unless the difficulties are considered of the other route. It was argued that, first by the great depth of the sea there is the risk of breaking the cable in laying it down, or perhaps injuring it so as to render it useless. Again the difficulty of repairing a fault. Again it is said by electricians that the electric spark travels slowly through submarine cables, so that a cable of six hundred miles, unless very large, does not allow more than ten to twelve words to pass in a minute. Thus the real work of a cable is reduced accordingly.

Seeing these difficulties, the Indian government determined on a good cable with stations at short distances, and that it should be laid in the least depths possible. These two conditions were secured in the

Gulf of Persia. On leaving Kurrachee, the last station of the Indian line, a shore line is formed along the Mekran coast as far as Gwidir where it commences its sea course. The first of these extends from Gwidir to Cape Mussendom, at the entrance of the Persian Gulf; a second from Cape Mussendom to Bushire on the Persian coast; a third from Bushire to Tao at the head of the Gulf and the mouth of the Shot-el-Arab, a large estuary which receives the united waters of the Tigris and Euphrates. In all of these portions the depths do not exceed one hundred fathoms at most, the ground being either sand or mud. At Tao the cable passes into the Ottoman territory. The Turkish government then undertook to construct the land line which should pass through Busorah, Bagdad, Mossoul, Diarbekir, and Sivas to terminate at Scutari, opposite to Constantinople. The telegrams having arrived there, were to be committed to European lines or rather those of European Turkey.

Such was the project of Colonel Stewart, the leading principle of which was to avoid long submarine lines, and to have the wires on *terra firma* everywhere that the hostile Turkish tribes did not oppose obstacles. It was already perceived that the transit through Asia Minor was the weakest part of the whole project, as much from the character of the people of Irak-Arabia, between Busorah and Bagdad, as from the indolence of the Turks in respect of all kinds of public works.

Thus there were about twelve hundred miles of cable to be made. The nature of the cable adopted by engineers for the sea differed but little from that formerly made. It still consists of a copper thread isolated by a coating of gutta percha and Chatterton composition, with a protecting covering of thick wires galvanized. But there were two innovations: the central copper thread, instead of being a collection of seven wires, was composed of four parts that closed on each other, one against the other, and the exterior covering of iron wire was itself protected by bitumenous covering. The construction of it was commenced in February, 1863, and finished the same year. The total weight of this cable for the Indian service was not less than six thousand tons. Six large sailing vessels were provided and were each fitted with three large circular tanks in which the cable could be coiled in sections. These tanks were also filled with water so that the cable would not be exposed to too much heat or dryness during the voyage. Each ship had also her party of electricians with their apparatus for testing day and night the state of isolation and condition of the whole cable embarked in them. The vessels sailed one after the other as soon as they had embarked their portion of the cable. During their passage by the Cape of Good Hope, from Plymouth to Bombay (the shortest passage of the six being ninety days), the engineers took the shortest route by Suez, and awaited their arrival in India.

The Indian government had five steam vessels at the service of the engineers, two of which assisted in towing the ships while the cable was being laid at sea, another, the *Coromandel*, had on board the chief of the expedition and his principal assistants. A smaller vessel,

drawing very little water, attended the landings, that is taking the ends of the cable on shore which the large ships could not approach. And another steamer of six hundred tons, the *Amberwitch*, was armed and fitted with a view to attending permanently the whole line of cable, to visit the different stations and to perform any repairs of the cable where necessary. In January, 1864, this little fleet were assembled off Gwidir, the place of commencement of operations and the first station of the submarine cable. Gwidir was already in communication with India by a line of telegraph. It consists of a small village in Belluchistan composed of a few straw houses standing on a sandy ground between two chains of very steep mountains. It is said to belong to the Imaum of Muscat who has an Arabian governor there, but the neighbouring chiefs dispute his authority.

There were some difficulties in placing the shore end of the cable, because the beach was so shoal that the ships could not approach it within three miles, but by means of the small vessel and boats they were overcome. The cable was then to be laid along the mountainous coast of Mekran in a depth between fifty and one hundred fathoms. There was a notion prevalent too that it would not be possible to lay a cable down along such a coast from a sailing vessel as she was towed by a steamer, on account of the slow rate at which they must go through the water and accidents of fouling each other. However a method was adopted by which it was considered all this would be avoided. As soon as the coils of one of the sailing vessels came to be expended another received the towline; the end was spliced to that of the other, and the operation continued of paying out from her. And at the end of three days' work the ships arrived in sight of the Arabian coast; the work of laying down met with no obstacle, and the first section of the cable was thus deposited.

Between two little bays which have between them the promontory which forms Cape Mussendon is the second station called Elphinstone at the entrance of the Persian Gulf, a station by no means considered desirable. It is seated on a little rocky islet just large enough for its purpose. The Arabs of the adjacent villages are all subjects of the Imaum of Muscat, but for all that are bad characters, even to being pirates when an opportunity offers, and can be but a poor resource in case of emergency for the assistance of Europeans.

But in the event of any danger threatening the staff of electricians two small vessels were moored in the bay to serve as a retreat for them. The adjacent country, including the mountains, is entirely sterile and barren, and the view of it from the bay is rather grand and imposing than pleasing to the eye. As for food, the place yields nothing but fish and oysters; the Arabs only, when they are disposed to do so, bringing eggs and fowls for sale. Colonel Stewart had the care and forethought to provide the station with a still to obtain fresh from salt water, and a machine for making ice, besides every thing else he could think of to make the stay in that station as comfortable as possible. He supplied it with a good library, every kind of useful article; fowling pieces, and pleasure boats. No doubt the staff here

are certainly completely out of the world, but after all the telegraph to them is everything and communicates to them the principal passing events which can interest them.

After some few days passed with the instalment of the cable at the Elphinstone Station and a visit to the Imaum of Muscat, whose friendship it was most important to secure, the little expedition resumed their sea work, and favoured by fine weather soon arrived at the third station, the town of Bushire on the Persian coast. Here they soon landed their cable and proceeded on for the next at the mouth of the Shot-el, and where they arrived on the 25th of March, and where the sea line was to terminate. The mud which is brought down by this great river extends to a considerable distance out to sea, so that to keep the cable along the shore it was necessary to lay it by hand on banks where boats could not approach without danger of being lost. On this service five hundred Lascars were employed who by hook or by crook managed to deposit the cable along the sea border as far as the next station at Tao the last of the submarine cable. Thus the line of communication was completed from the mouth of the Indus to that of the Euphrates; and the cable was happily in a perfect condition. A trifling accident, however, which occurred at Bushire, served to illustrate the facility with which this cable could be repaired. The electricians determined the exact distance of the fault: the steamer *Amberwitch* proceeded as soon as possible to the place of failure: in two or three days the fault was repaired, and signals passed as usual.

Unfortunately the land line which the Turks had promised to organize between Tao and Constantinople was not ready. From Bagdad to the Bosphorus the line was in working condition, but that between Bagdad and Bussorah was not laid and seemed likely not to be. This part of Messopotamia happens to be occupied by Arab tribes which the Turkish government cannot control. The Turks appoint their Sheiks among them that are not always accepted; and this proved to be the case on the present occasion. There was then an opponent to the Sheik appointed by the Porte in a native chief, who was eventually defeated and compelled to fly to the desert. The English government had offered to the Sultan themselves to deal with the rebels, proposing to pay them a sum of money, to gain their protection of the cable. The offer however was refused, but tranquillity was very soon restored, and the work of laying the cable went forward. While it was being completed despatches were sent between Bussora and Bagdad on horseback, the communication occupying two or three days. At the same time, this portion is not so favourable to progress as one might be led to believe, for Europeans are attacked by fevers and other ills during several months of the year. Five steamers navigate the river between Bussorah and Bagdad, two of which belong to the Turks, two to the Indian government, and the other to an English merchant resident in the country.

While this subsidiary service was carried on, the despatches passing between the home and the Indian government, were thus subject to a

tiresome delay in the very midst of their transit. They left Kurrachee in English; on reaching Tao at the end of the submarine cable they were translated into Turkish, in which language they were sent to Constantinople, and resumed their English dress by another translation at this latter place. The Turks pretend that it is impossible for them to send telegrams in a foreign language. However this inconvenience was remedied in September, 1864, by a convention in virtue of which the Ottoman government engaged to select persons for the line who should thoroughly understand English. At the same time the English electricians little confident in Turkish activity determined to establish new lines from their cable into Europe. At our suggestion the Shiek of Persia undertook the construction of a large Telegraphic Establishment in the interior of his dominion. The maritime Station of Bushire was connected with Teheran, Shiraz and Ispahan. From Teheran two other lines started; one of them to Bagdad so as to avoid by a long detour the turbulent country Irak-Arabia; the other to Tiblis joining the Russian Empire through Tabriz.

It was not till April of 1865, that these two lines were completed, and that there was a complete telegraphic communication between Europe and British India. Some despatches of an important nature which travelled in a few hours the immense distance from Calcutta to London produced a considerable effect in England, but still British commerce did not obtain that celerity which this mode of communication promised. We shall see the causes which delayed the despatch of the telegrams.

It was in 1856, that English engineers determined on laying down a cable in the Atlantic to America. Although the attempt was then premature, for the construction of the cable was yet in its infancy, the British public encouraged the idea and soon the capital of about five hundred thousand pounds was acquired to carry it out. The history of this adventure has long been amply recorded. The company succeeded in August, 1858, in laying down their line between the coast of Ireland and Newfoundland. For some days despatches were exchanged between the two continents, but after a very short triumph the line became useless. It was soon found that it was broken and left no hope of ever being repaired. When experienced men learned the cause of the mischief they were no longer surprised that the cable was so soon useless. As in all such proceedings experience soon shewed the cause of the failure and the mode of avoiding it. For the public, however, it was a temporary condemnation of all electric cable enterprises in the high seas, yet for the engineers it afforded a lesson from which they resolved to profit.

Some years were required for capitalists to recover their lost confidence, but at length the company in 1863 collected the sum required to recommence operations. With the most meritorious perseverance they had obtained assistance in favour of their project, and the Government appreciating the immense political importance of sending assistance when needed to British America, guaranteed an annual sum of twenty thousand pounds. Wealthy merchants and

companies, whose vessels were perpetually crossing the Atlantic showed the great importance and utility of a cable for immediate information on business concerns, and the security of their transactions. Every where, in the principal towns and among all classes of Society, its importance was explained and how much the national honour would gain in the result of such an enterprise, and such was the interest felt concerning it, and the confidence in the scheme that it was again warmly taken up. A new capital was raised and an annual interest awarded of eight per cent. preference on the future profits of the cable; the old capital, the value of which was suspended, only bore interest of four per cent., and it was presumed that the net annual revenue would not be less than four hundred thousand pounds, so that there would be a supplementary dividend besides a reserve fund to reconstruct the capital itself after two years of work. Fair as these promises were it will soon appear they were far below reality. Still success was not yet attained, and for impartial eyes there were yet very formidable chances against it.

The great work in hand it is necessary to follow step by step, in order to fully appreciate the prudence and foresight of those who had charge of it. From the moment they were relieved from the possibility of the want of capital, the company appealed to the public with the utmost confidence, inviting engineers or makers of cables to send models of the most approved submarine conductor. These models were submitted to a committee of the most distinguished individuals in electric science. The committee adopted for their type the same diameter of the cable as that which was taken for the line between England and France and France and Algeria in 1860. The central thread of the conductor is formed of seven copper wires of a total diameter of 0·14 inch: the isolating substance being of twice the thickness. This may be called the very heart of the cable, the only essential part in an electric point of view, and these dimensions vary with the length of the cable in order to secure that rapidity of transmission of the electric fluid which is desired. This core of the proposed Atlantic cable was enclosed first in a covering of gutta percha, then round this protection was a composition called Chatterton's Compound, and then ten strong iron wires with a view to give it strength and lateral resistance. And with the view also to the protection of these as well as to lighten the whole mass they were covered with Manilla hemp. The whole cable then had a circumference of 3½ inches or a diameter of over an inch and a tenth. This model was produced by Messrs. Glass, Elliott, and Company, at the head of this important manufactory in England. The scientific committee of the Company not confining themselves to choose the form of cable only, turned their attention to the principle of its construction and the means of controlling it in laying down, and were careful that nothing should be neglected and every experiment tried in order to secure success in this all important operation.

The amount of cable required was enormous, a length of between two and three thousand miles, requiring a whole year for its con-

struction. Commenced in April, 1864, it was not finished until May, 1865. In this interval the engineers of the Company were occupied in considering the means of transporting the cable, and planning the most secure means of laying it at the bottom of the sea between Ireland and Newfoundland. The Atlantic here is about two thousand miles across with a pretty nearly constant depth of four to five thousand yards. And nought else but an immense gulf without submarine mountain, without an island, and nothing but an expanse of water of which it is difficult to reach the bottom. The coasts and their approaches on each side were studied with an attention unknown in 1858. Above all things a sandy bay was needful in which the descent to great depths was uniform, free from ridges, and sharp rocky prominences. For these rocks were found to risk injury to the covering of the cable, and again when it might be resting suspended between two mountain ridges there was danger of its getting broken.

The place of departure was fixed at Valentia, and that for landing at Heart's Content in Trinity Bay of Newfoundland. Then as to transport, the difficulties to be met might be judged when it was considered that the cable formed an undivided mass of 4,500 tons, to which should be the necessary fuel and all the material required by the company for at least 15 days. When the expedition of 1858 took place, the cable was divided between two vessels,* ships of war, of large tonnage, which separated at the middle of the line, each one after the two ends were joined laying down the part she had on board in opposite directions. But this mode of proceeding was abandoned for good reasons. One ship only in the whole world was capable of carrying this huge mass, and this was the giant ship, the marvellous work of Brunel, the *Great Eastern*, lying in the Thames after two or three voyages across the Atlantic. This colossal steamer was therefore appropriated for the new purpose. Three large iron tanks capable of receiving the whole cable were constructed in her, in which it was kept immersed in water during the voyage. The machinery for paying out consisting of rollers, etc., were fitted on board: the crew was carefully selected, one of the best commanders of Cunard's line of packets was selected for her command. A whole staff of electricians, engineers, workmen, and seamen, making about 500 on board were embarked, and even all the respectable journals of England had their correspondents on board. In fact the whole country displayed the most lively interest in the success of this undertaking.

What was the result of this enterprise attended with so many good wishes. Every one knows, for the journals have faithfully given it. In the beginning of July, the *Great Eastern* left the Thames for the coast of Ireland escorted by two ships of war the *Terrible* and *Sphynx*. The thicker part intended for the shore end was laid down without difficulty as far as the depth of 200 fathoms, and the general cable spliced to it, and the great ship started on her mission adopting a rate

* These were the *Agamemnon* and *Niagara*. See *Nautical Magazine*, 1858, page 475.

of five to six knots an hour. During the night when the ship was about 84 miles from the land, the electricians found there was a fault in the conducting power of the cable and that it would not be right to continue the voyage without its repair. It was therefore decided to recover the cable paid out until the defective part was reached, which was considered about ten miles distant. After a whole day's work devoted to this difficult operation a small piece of the wire was found sticking in it, having penetrated the gutta percha coating, apparently an insignificant affair but one which in itself was sufficient to destroy the virtue of the whole cable. The repair however, was soon effected, and the vessel resumed her course.

For five days everything went on without interruption in laying the cable, and the satisfactory working of everything connected with it was the theme of observation. But soon a second interruption took place. On examining the cause of this, another clipping of copper wire was again found to be the cause of it. This was also repaired, and for two days more the vessel continued her course. But the 21st of August witnessed a third interruption of the work. Here the cable was broken and the end quickly disappeared in the sea. The *Great Eastern* having then accomplished two thirds of her voyage was then 1062 miles from Valentia and about 600 miles from Heart's Content. Hitherto signals had been constantly exchanged between the ship and Valentia. After this accident some 15 or 20 days elapsed without any news of the ship, and report gave out that she was altogether lost. But when she appeared again an account of her proceedings was soon made known.

As soon as the fracture took place, Mr. Canning the engineer, who was superintending the paying out determined on dragging for the lost end, to bring it to the surface. The difficulty of this operation may be easily imagined, from being unprepared for it in a depth of above 2000 fathoms. In fact it was a process without precedent in such a depth. Nevertheless an iron grapnel attached to a long chain was dropped overboard, and the vessel made small boards over the part where the cable was sunk. Three times the grapnel hooked the cable and each time the line was broken in bringing it to the surface. It was quite evident that nothing could be done without better materials than those on board the *Great Eastern*, and the three vessels parted company, the *Great Eastern* returning to England.

This was the result of the enterprise for the year 1865: twelve hundred miles of cable valued at between three and four hundred thousand pounds were abandoned in the bed of the Atlantic Ocean. This failure however was but a temporary suspension of proceedings, the progress which had been made was at once the promise of future success. It was acknowledged that the cable in point of strength, size, and isolation was perfect. The machinery for controlling and paying over was all that could be desired. The apparatus for raising or recovering it after it was laid down might be improved. As to the ship herself, all agreed that she was exactly adapted for the work. Remarkably steady in bad weather, easily managed, she had besides

enormous capacity, all of which excellent qualities would be sought for in vain elsewhere. While the results of this expedition deserved success, the experience which had been gained, proved beyond doubt that success was to be gained. Indeed some were thoroughly persuaded that the unfortunate accidents in paying over the cable had occurred not fortuitously but from ill-will. They would not believe that the little bits of copper wire found sticking in the cable were the result of accident and attributed them to design. But such suspicions would not be founded on any indisputable evidence although the general event seems to have given them some probability.

It was not long after this catastrophe before the views of the company were resolved on. As soon as it occurred their council met and adopted the determination of still completing the telegraph between the two continents. The season was too far advanced to do anything at sea in the course of that year, but it was announced that a new cable would be immediately commenced of the same kind, which should be deposited in the following summer of 1866, and moreover that the old cable should be found and continued to Newfoundland. This operation was perhaps more remote in probability than the laying of a new cable, for very many doubted the possibility of finding it in the depths of the wide ocean. But the officers of the ship were confident of their observations as to the position of the *Great Eastern* where the cable was broken. Thus two cables instead of one formed the subjects of solicitude for the year 1866. Another sum was wanted, the company had expended its capital and they were not permitted by law to enlarge it by a loan. Hence another company was grafted on the old one under the name of the Anglo-American with a capital of six hundred thousand pounds divided into sixty thousand shares.

(To be completed.)

JAPAN AND THE JAPANESE, AND THEIR NEW PORTS OF OSACA AND NEEGATA.

JAPAN, to use a homely expression is opening out. And although it may be long before it shall become thoroughly civilised, still good progress is being made, and a country which, but a few years ago was sullenly locked up within its own prejudices and horror of external relations with that world of which it formed a part is now greedily adopting our arts and sciences. No doubt the peculiarly enquiring disposition of these remarkable people, and their great superiority of mind over their Chinese neighbours, have given them much advantage and more readily secured them these results. It was but lately that we read of a Japanese steamer constructed in Japan and navigating between those islands and the American coast, entirely officered and manned by natives. But, go where we may on the China coast, no

such progress is to be seen, and the old junk, with eyes painted in her bows, that she may see her way before her, or the evil water-sprites by which she may be assailed, still remains, after a century of intercourse with our seamen and their ships and steamers, as the emblem of Chinese stagnation.

Those who assist themselves find in such a busy world as ours those that are quite ready to give them a helping hand. Thus, it is well known that many Japanese youth are at present following their studies in some of the principal European cities. Holland, it is well known, had long been acquainted before we were with the Japanese, and the Dutch school naturally attracted the attention of those islanders when it was determined that the spell of exclusiveness should be broken. France, Russia, and our own country also shared in receiving some Japanese youths for tuition in the arts, and the public prints have very recently borne testimony to the marked attention and civilities which a Japanese Prince has received at our principal arsenals. For thoroughly nautically inclined as they are, being islanders like ourselves, everything nautical has more than ordinary attractions for them.

There is a group of islands in the Pacific Ocean that were discovered by our great circumnavigator Cook that may be looked on as the most advanced in civilization and in knowledge of the arts and sciences above all other groups in that extensive ocean.

The Sandwich Islands, to which we allude, is governed by a native King, with a Constitution (however it may have been since altered) that was given to them from our land. On a visit of several of the Royal Family of Owhyhee to this country, now nearly half a century ago, it is very well known that on Lord Byron conveying back the last remnants of them, left them a code of laws as a foundation for their future government. Their progress since those days has been gradual, and of late years, indeed, rapid—owing, of course, to the settlement among them of Europeans, but principally, we believe, American people. They have collegiate schools, and an English bishop, as the Dowager Queen who has recently been among us has testified. And the distance of three or four thousand miles which separate these islands from Japan, in these days of steam navigation throughout the world, is no barrier to a constant communication between them. Constant intercourse seems to have been established, and the Sandwich Islanders and Japanese are profiting by supplying each others' wants. Indeed, on the part of the latter, the intercourse cannot fail in being most profitable if only in the way of civilization.

Among the exports of Japan to the Sandwich Islands appear to be some beautiful specimens of the *flora* of Japan, and we perceive by a Sandwich Island print, with which we have been acquainted now for several years, an account of the visit to Japan of a gentleman, Mr. Van Reed, from the Islands, who gives the following account of his mission; and as his account may interest our own horticultural and botanical friends, we transfer his letter entire. The vessel, it will be seen had a remarkably good passage, as thus remarked:—

The fine ship *Minnchaha* arrived at Honolulu on the 21st of

October last, from Yokohama direct, and the opportunity afforded by her departure was embraced by our Consul-General, Mr. Van Reed, to send another and larger collection of Japanese seeds, bulbs, plants, and birds. Owing to the short passage of the ship and the special care taken of the birds and plants by Captain Bursley, and a Japanese attendant of Mr. Van Reed, all the plants and a part of the birds have arrived in the finest condition; indeed, they could hardly have reached here in better order from San Francisco. We have been favoured with a letter from Mr. Van R., relating to these articles, which we consider of so general interest that we copy such portions of it as refer to them.

"Kanagawa, Japan, September 15, 1867.

* * * * "I considered the opportunity so valuable to supply the Islands with plants, seeds, and birds direct from this country, that I decided upon sending my Japanese assistant to look out for their safety on the voyage. I send an excellent selection of plants, including *tea seed, tea plants, rape seed*, which makes an excellent oil for the Japanese, and is worth here 250 dols. per picul; some *camilla seed; camilla plants* ready to blossom; orange trees; some lily bulbs, a large variety; and what I consider paramount to all is the variety of mulberry plants, still having faith in the idea that you will raise silk-worm eggs, cocoons, etc., for exportation. Of tea seed, a quantity is sent; and why should you not raise tea of as excellent quality as the Japanese. Here you may now try your luck with the *best of plants and seed sent.*

"I also send a variety of pine, thriving well, and about 1000 trees of about 18 inches in height. They will do well, and I would advise that they be planted on the road-side so as to form in time an *Alameda*—something like the road between Santa Clara and San Jose in California, and give you an idea of our *Tokaida* here, a road leading through the Empire, shaded on each side by these trees, whose tops almost join from either side, forming a shaded passage for man and beast.

"In the variety sent will be found the Japanese persimmon, a most delicious fruit, unlike anything you have tasted, and highly appreciated here. The variety sent is the best, called *minno kake.*

"Of the birds sent, I intend for the Society, one cock and two hens, golden pheasant; one cock and two hens, silver pheasants; one cock and two hens, mandarin ducks.

"In charge of my messenger I send you a small box of Japanese tea, a quality which does not leave Japan, *owing to its excellence.*

"The presents I send the Society I hope may prove acceptable,—not knowing exactly what would be most appreciated; but tea, camilla seed, mulberry trees, rape seed, pheasants and ducks, I hope may not be amiss, and help to introduce for the benefit of the Islanders. * *

"Sincerely yours, VAN REED."

The collection, as put on board at Yokohama, embraced—golden pheasants, three cocks and four hens; silver pheasants, three cocks and four hens; ducks, three cocks and four hens; bantam and hairy fowls, a variety of each; 1,000 pine trees; 1,250 lily bulbs, assorted

varieties; 100 mulberry trees; 65 tea plants; camilla seeds and plants; orange trees; tea seed; rape seed; and a variety of other choice flowers and plants not enumerated. The whole comprises some thirty or forty cases, and is the most valuable if not the largest collection ever imported.

It will be seen from Mr. Van Reed's letter, that a part of this very large collection are intended for the Agricultural Society; but really we believe that what is given to that body will be so much thrown away. As considerable expense has attended the collecting and importation, we would suggest that the entire collection be disposed of at public auction in lots, so that those who want them most and are willing to pay for them can obtain them.

Some of the lilies, of which there are twenty or thirty varieties, are said to be unsurpassed in beauty by those of any other country. Here is an account of one sent to Philadelphia recently, which we clip from the Philadelphia *American* :—

"A Wonderful Flower.—At the Horticultural Exhibition on Tuesday night, was shown a single specimen of the Japanese lily. All adults will remember in their boyhood the flaming "tiger lily" that ornamented the country gardens. This grand flower is the tiger lily upon a scale of triple magnitude, but with an equal hue, in which a delicate solferino is lost in snowy white. The calix itself is fully nine inches in diameter; the petals are delicately spotted with black; the pistils are upholsterers' hammers in miniature. The odour of the flower is most exquisite. It has all the volume of that emanating from the tuberose, with all the delicacy of the primrose or violet. To the flora of any country it is most valuable. It cannot too soon be introduced into every garden. Horticultural Hall is by no means small, yet the perfume from this single blossom pervaded every part of it. Excepting only the blossom of the Victoria Regia, it is the largest flower we have yet seen."

If any of these choice flowers are in the collection, they will be a prize worth obtaining, and care should be taken with all the bulbs, so that none may be lost through negligence.

The pheasants, or a portion of them, should be sent to East Maui, as the climate of the highlands of Ulupalakua is admirably adapted to them, and no man in the kingdom has better facilities for caring for them, or will take greater pains with them than Captain Makee. After they get to breeding, they can safely be transferred to the other islands. These pheasants, though small birds (about the size of domestic fowls) possess most beautiful plumage, and will prove an acquisition to our list of birds. Though generally kept for ornament, they are eatable.

The ducks will thrive, no doubt, anywhere, but if sent to some quiet country farm house, they will have a better chance to become acclimatized and to breed there than if kept here in the city.

From a file of Japanese (Yokohama) papers to 18th September, the following information has been culled, shewing the state of affairs in Japan, which may be congratulated at length as having a liberal-

minded ruler. Neither life, limb, nor property would appear to be safe there. A robbery at noonday by two *Europeans* of a *rouleau* of dollars from the servant of a gentleman who had sent him to exchange them for *boos;* two successive attempts at burglary by *Japanese* on the house of a commissariat; two others at stores—one by a European, one by a native; two seamen killed belonging to a British man-of-war; an attempt by a Japanese mob to kill the Dutch Minister—are certainly indications of a lawless state of society, showing a lack of executive authority, which makes a residence in any part of the Empire more or less hazardous.

Yet for all this, there has unquestionably been some improvement in the Government of Japan. The present Sovereign, commonly called Tycoon, but more properly Shogoon, has been on the throne only about a year. He is a young man of great ability and literary acquirements, for a Japanese, very liberal in his views, and about thirty-two years of age. One of his first acts after becoming sovereign, was to call all the foreign representatives together and with them make an excursion to Osaca. On this excursion he freely exchanged views with them, and sought all the information he could gather as to what was the best policy to pursue. The result has been that the exclusive policy handed down for 800 years has been broken through, and the daimios or princes released from the bondage they were formerly in. The Shogoon or Emperor has been compelled to remove his court from Yeddo to Osaca, and is in some respect subordinate to the Mickado or Spiritual Emperor.

The government of Japan consists of an oligarchy of feudal princes called daimios, each prince being the governor of a province or state, wielding absolute authority in his domain, but subject to the general authority of one of their number, chosen by themselves, who is styled the Tycoon or Shogoon. This sovereign presides over the great Council or Congress of Representatives from all the provinces, but still is subject to the authority of the Mickado or Spiritual Emperor, who is really the supreme head of the Empire. It is a singular system, but its adaptability to the wants of the Japanese people is shewn by this fact that it has existed almost unchanged for over one thousand years. Such a state of things is no bad representation of what has occurred and is now going on nearer home. Where spiritual advisers rule, the policy is and would always be as narrow-minded and exclusive as that which has hitherto kept Japan a closed country, and which would never have opened its ports.

The present Shogoon has opened his reign by abolishing that despotism under which the daimios were placed, by ignoring the law which required the immediate death of all strangers, especially Christians, and also another law which forbade any Japanese to leave the country, and finally by opening new ports to foreign commerce, and permitting foreigners to travel in any part of the Empire, under certain regulations. These are great changes for one sovereign to make, when it is remembered that to effect them the policy of centuries had to be broken up, and, we may add, the exclusiveness of spiritual advisers had to be set aside.

Thus it will be seen that the present new Japanese government has opened a more liberal policy with foreigners, and removed all restrictions on travel inwards or outwards. They must tend to give an impetus to its commerce, and may in the course of years lead to the establishment of trade between these (Sandwich) islands and Japan,—certainly there is nothing now to prevent it. The first of January of this year, it will be remembered, opens the new ports of Osaca and Neegata.

Respecting the latter, the following information has just been received, and we may congratulate our seamen not only on getting the port for their frequenting, but also on finding it so favourably situated in regard to the intelligence and good feelings of the natives.

The *Japan Times* learns that it is pretty positively settled that Neegata is the port which will be opened on the west coast, and that the island of Sado, now used as a penal settlement, will be made accessible to foreign ships—an announcement which derives interest from the report that the island contains gold. The official plans of the proposed foreign settlements at Hiogo and Osaca have been published.

In prospect of the speedy opening of the new ports in Japan, the following particulars relative to Neegata, which have been communicated to the *Evening Express* of November 23rd, by a gentleman who has visited the place, will be read with interest:

"Neegata was the port on the west coast originally selected for foreign commerce, but like that of Osaca, its opening has been postponed from year to year, and frequently objected to on the ground that it is not a good harbour for vessels of large size. It has, however, the advantage of being a great rendezvous for native craft, the only imperial port on the coast, and therefore the only one at absolute disposal of the Yeddo government, and moreover it is opposite the island of Sado, which has several small but secure anchorages, which are convenient for ships in bad weather.

"It has been surveyed by Commander Bullock, of Her Majesty's ship *Serpent*, to whose ability and persevering discharge of the double duty of surveyor and commander, future navigators will be deeply indebted; indeed, it is our intention, on another opportunity, to notice the *Serpent's* services in comparison with some of Her Majesty's ships upon the China and Pacific stations. That active British representative, Sir Harry Parkes, also visited the place, to satisfy himself of its eligibility.

"Though lying some two hundred miles S.S.E. from Hakodate its climate is said to be far more rigorous, and the summer shorter, the high ranges shutting out the morning rays of the sun. The prevalence of northerly gales off the bleak chill district of the Amoor, and the cold current setting on this coast from the northward, are some of the chief causes of a far different climate from Yokohama on the east coast in nearly the same latitude, the latter having the benefit of the warm current from the tropics. The fall of snow is greater than at Hakodate, and the abundance of timber enables the residents to construct better

houses to resist the severity of climate; the injury from earthquakes is less frequent than in many less mountainous parts of Niphon. Gold, silver, and many useful minerals are said to be abundant, also timber; the produce of the immediate district is comparatively scanty, but it is, however, frequented by great numbers of native vessels, and a large trade is said to be done in exchange of commodities from the various parts of the country.

The inhabitants have the character of being very orderly and hospitable. Their personal appearance is superior to those of the east and south coast; indeed it is from this district that the greater number of the beauties of Yeddo and Osaca are purchased when young, the climate and mountainous character of the district tending, as in other countries (the Alps and interior of China to wit), to a fairer complexion and superior physical development.

LUNARS.

ALTHOUGH, owing to the general use of chronometers, and to the rapid passages made by ships of the present day, the lunar observation is not of the importance attached to it a century ago, yet occasions may, even now, arise, in which it may be the salvation of a vessel; and it ought, therefore, to be frequently practised by every person entrusted with the duty of navigating. That such is not the case, is perhaps, to be attributed to the fact, that the methods called "rigorous," are generally difficult and laborious; while the more simple methods require a number of *special* tables, to master the intricacies of which presents discouragement at the outset. The following, founded on Lyons' formula, only requires the two small tables annexed, in addition to those in every-day use; and will it is believed, furnish the navigator with a simple and expeditious means of ascertaining the Greenwich time, and thus enable him to detect any great irregularity in the performance of his chronometer. The observation itself does not really present those difficulties so frequently imagined. A very little practice will render a person a fair lunarian, while apart from considerations of utility, the intellectual pleasure to be derived ought to compensate for the small amount of labour necessary to be incurred.

RULE.

I. Augment the refraction for each body by the seconds from Table I., and when the sun is one of the bodies, subtract 9″ from its augmented refraction.

II. From the moon's horizontal parallax subtract its augmented refraction, naming the result the *corrected parallax*.

III. With the apparent distance, or its supplement, as a *course*, and the augmented refraction for the sun or star as *departure*, take from the Traverse Table, *dist.* and *diff. lat.* which call (*a*) and (*b*).

IV. Compute (A) and (B) as shewn in the example.

V. When the app. dist. is *greater* than 90°, *all* the corrections take the *minus* sign. When the distance is *less* than 90°, (B) alone, takes the *plus* sign.

VI. If the signs of the corrections are alike, their *sum*, with the common sign, is correction I.: but if *unlike*, their difference, with the sign of the greater, will be the correction: which, being applied to the app. dist. gives the true dist. nearly.

VII. This distance being further corrected by Table II. gives the true distance; from which the Greenwich time is to be deduced in the usual manner.

Note.—Correction II. takes the *same* sign as B.

Explanation of Table II.

Add together the corrections in altitude of the two bodies, and with this sum and correction I., take the seconds from the column marked N. With their difference as *departure*, and the app. dist. as *course*, take diff. lat.—this, as seconds, is corr. II.

To find the small corrections to be applied to (A) *and* (B).

With (*a*) as *dist.* and moon's altitude as *course;*
„ (*b*) „ sun, or star's „ „

take corresponding *departures*, and subtract them, as seconds, from (A) and (B).

Thus, in the example,

91 as *dist.* and 33° as *course* give *dep.* 50.
25 „ 37° „ „ 15.

When the apparent distance exceeds 90°, its supplement is to be used as a course, in finding the corrections (*a*) and (*b*).

Example.

Given:—App. dist. 106° 28′ 27″ (*d*); sun's A.A. 37° 23′ (*s*), moon's A.A. 32° 49′ (*m*), H.P. 54′ 20″. corr. in alt. 44′ 11″; to find the true distance.

Moon's H.P.	54′ 20″	sin (*d*) 9·9818	tan (*d*) 10·5291	
Aug. Ref.	1′ 48″	cosec. (*s*) ·2167	cosec. (*m*) ·2660	
Corr. Par.	52 32	p. log. ·5348..	p. log. ·5348	
Sun's Aug. Ref. minus 9″ ..	87″	p. log. 0·7333	p. log. 1·3299	
		A. — 33′ 16″	B. — 8′ 25″	
a = 91″		(*a*) and 33° 50	(*b*) and 37° 15	
b = 25		— 32 26	— 8·10	
		— 8 10		
Moon's Corr.	44′	Corr. I. ..	— 40 36	
Sun's	1	App. dist.	106 28 27	
	45 18″		105 47 51	
Corr. I.	41 = 15	Tab. II. Corr. II.	1	
	Diff. 3	True. Dist.	105 47 50	

This agrees with the more rigorous methods within 1″.

TABLE I.

Augmentation of Refraction.

Alt.	Aug.	Alt.	Aug.	Alt.	Aug.	Alt.	Aug.	Alt.	Aug.
2°	1″	26°	13″	50°	27″	73°	43″	85°	54″
4	2	28	14	52	29	74	44	86	55
6	3	30	16	54	30	75	45	87	56
8	4	32	17	56	31	76	46	88	57
10	5	34	18	58	32	77	46	89	58
12	6	36	19	60	34	78	47	90	59
14	7	38	20	62	35	79	48		
16	8	40	21	64	36	80	49		
18	9	42	22	66	38	81	50		
20	10	44	23	68	39	82	51		
22	11	46	25	70	40	83	52		
24	12	48	26	72	42	84	53		

Note.—From the sun's augmented refraction subtract 9″.

TABLE II.

For the second correction of Distance.

Corr	N	Corr	N	Corr	N
10′	1″	38′	13′	52″	24″
15	2	40	14	53	25
19	3	42	15	54	25
22	4	43	16	55	26
24	5	44	17	56	27
26	6	45	18	57	28
28	7	46	19	58	29
30	8	47	20	59	30
32	9	48	21	60	31
34	10	49	22	61	32
36	11	50	23	62	33
37	12	51	24	63	35

Dartmouth, December 10th, 1867. A. C. J.

Japan.—Currency.

The Japanese currency has from the earliest times been at the mercy of such accidents as the discovery of new mines of gold, silver, or copper, the admission or exclusion of foreign merchants, and the operations of foreign trade. We may thus trace how edicts have been framed to limit or forbid the export, the import, or even the very use of certain coins, how the relative values of gold, silver, and copper have been violently altered to check an illegitimate commerce, or how new coins have been introduced to meet the exigencies of an embarrassed exchequer.

In consequence of the seclusion to which Japan has for ages more or less relentlessly condemned herself, the relative values of her gold and silver have depended rather on the productiveness of her own mines than on the proportion between the two metals as it existed in the rest of the world.

The earliest foreign writers concur in showing that there was a marked disproportion in favour of gold, from its rich mines of which Japan was at a very early period famous.

Marco Polo, who wrote as far back as A.D. 1298, and related the expedition which had been undertaken against Japan by Kublai Khan, at whose Court he resided for many years, says—"The inhabitants of

Zipangu have gold in the greatest abundance, its sources being inexhaustible; but as the King does not allow of its being exported, few merchants visit the country. Hence the wonderful richness of the Sovereign's palace, according to what we are told by those who have access to the place. The entire roof is covered with a plating of gold, in the same manner as we cover houses, or, more properly, churches with lead. The ceilings of the halls are of the same precious metal; many of the apartments have small tables of pure gold, considerably thick; and the windows also have golden ornaments. So vast, indeed, are the riches of the palace that it is impossible to convey an idea of them."

Kämpfer, who wrote in the beginning of the eighteenth century, thus speaks of the wealth of Japan, with which he was acquainted better than any other foreigner of his time:—"The greatest riches of the Japanese soil, and those in which this empire exceeds most known countries, consist in all sorts of minerals and metals, particularly in gold, silver, and copper."

The natural result of this unusual abundance of the precious metals was their exportation by all those foreign merchants who were at one time or another permitted to trade with Japan. For some reason, probably such a one as led in later times to the run on the gold currency, demand was first made for silver.

Ralph Fitch, an Englishman, who was at Malacca in 1588, and describes the trade of the Portuguese merchants with Japan, writes thus:—"They have a great carac, which goeth thither every year, and she bringeth from thence every year about 600,000 crusados" (more than 500,000 dollars).

In one year, 1637, six Portuguese galliots visited Japan with cargoes of silk, and carried away in exchange 3,000,000 dollars. It will probably be within the truth to say that in the course of the ninety years during which the Portuguese traded with the country (1548—1638) not much less than 50,000,000 dollars worth of silver, or more than £10,000,000 sterling, were taken out of the country.

The Dutch, who opened trade in 1609, were not behind the Portuguese in their pursuit after the precious metals. In 1640 we find them exporting 1,400 chests of silver, each of 1,000 taels, that is, nearly 2,000,000 dollars.

From this time gold usurped the first place hitherto held by silver as an article of export. In the two years 1670-71 more than 100,000 gold coins called kobangs or £180,000 were exported.

If dependence is to be placed on a Japanese pamphlet on the origin of the riches of Japan, written in 1708, by Arrai Tsikugo no Kami, the following amounts of silver and gold were conveyed out of the country from 1611 to 1706:—silver, 112,268,700 taels (nearly £34,000,000); gold, 6,192,600 kobangs (over £11,000,000).

An edict was issued in 1671 prohibiting the further export of silver, and the following year, with a view to render the export of the gold kobang less remunerative, its nominal value was raised in the proportion of 17 to 15; at all events, the Dutch were made to receive it at

this rate, though it is doubtful whether it ever obtained currency at that rate in the country.

In 1696, its fineness was, with the same object, reduced from 20 carats 10 grains to 13 carats 7 grains.

In 1710, a still more violent change was effected by reducing its weight from 4·7 momme (273·7 grains troy) to 2·5 momme (145·6 grains troy), though in 1730 a slight improvement to the extent of about 5 per cent. was made in the fresh issues of this coin. About this period the export of gold ceased.

But in 1664 a run had commenced on the copper coinage of the empire, and went on increasing till in 1685 a law was passed to limit the annual export to 25,000 piculs (1,480 tons).

In 1714, it was found necessary to reduce the amount to 15,000 piculs (888 tons); while in 1721 a still further reduction was effected, and the total amount limited to 10,000 piculs (592 tons). Nevertheless, we learn from the pamphlet above quoted that the export of copper from 1663 to 1708 amounted to not less than 11,144,467 piculs (563,857 tons).

According to Sir Stamford Raffles, who was Governor of Java during the short period that that island was in the hands of the English, and who thus obtained access to many valuable papers of the Dutch East India Company, in the two hundred years from A.D. 1540 to A.D. 1740 Japan must have been drained of bullion to the value of 200,000,000 dollars.

The first money coined in Japan, according to Kämpfer, was struck, or rather cast, A.D. 708, in the reign of a female Mikado named Genmisteno. A native work quoted by Hildreth, in his valuable work on Japan published in 1856, attributes the honour of making the first gold coins to Taico-Sama A.D. 1590. Japan has had as extensive a numismatology as most countries; a native treatise published in 1822 at Yeddo contains descriptions and engravings of 550 different coins,

Reference has already been made to the kobang. There are other gold coins mentioned by Kämpfer as current in his time, but they were merely multiples or parts of that coin, and were not in very common circulation. Silver coins properly so called seem hardly to have existed, that metal obtaining currency according to weight certified by Government marks of stamps. The ordinary small coinage of the country was the copper, or iron and copper, sein or kas; these were circular, with a square hole in the middle, for the purpose of stringing. Some were of double size and value.

When the American Commodore Perry visited Japan with his squadron in 1853, he found the following coins in circulation:—

1. A small round coin with a square hole. It was called cas or cash by the Americans.

2. A similar larger coin weighing less than two of the former, but bearing a fourfold value. It was probably the two-kas piece mentioned by Kämpfer.

3. A large lozenge-shaped bronze coin called a tempo, bearing a nominal value of 96 or 100 kas, but intrinsically worth only 7 of the

kas. The result of the introduction of this highly over-valued coin had long since been to drive out of circulation the old copper kas of Kämpfer's time, and to increase the nominal value of everything as reckoned in the new kas.

4. An oblong silver coin, called an ichibu, or bu, and valued at 16 tempo, or 1,600 kas.

5. A smaller coin of the same shape, equal to a quarter of an ichibu.

6. A similiarly shaped coin, composed of gold and silver, and worth half an ichibu.

7. A small oblong gold coin, valued at 1 ichibu.

8. A very thin oval gold coin, valued at 4 ichibu, but intrinsically worth much more. This coin was called a kobang.

9. A much larger coin similar to the last, and called an obang.

The Japanese currency was at this time in a very anomalous state, owing to the over-valuation of the silver coins as compared with the copper and gold coins. The silver ichibu was a coin which obtained circulation, not in accordance with anything approaching the worth of the metal it contained, but at a rate more than three times that value. A person purchasing manufactured articles was expected to pay less than half their weight in ichibus. Gold bullion or coins might be purchased, it was said, for three and a half times their weight in silver coins. The ichibu was in every sense a token coin.

The Commander and officers of the American squadron, however, were unable to view the matter in this light, and attempted to force their silver dollars into currency, at a value corresponding to their exact weight in ichibus. The Japanese resisting, a Mixed Commission was named to try and settle the question.

The Japanese Commissioners contended, with perfect justice, that they ought not to be required to take the dollars at more than their bullion value, the same as that at which they obtained their silver from the mines, asserting that, as their foreign die and assay gave them no additional value, they were worth no more to them.

The American Commissioners, on the other hand, maintained that, at this rate, the Japanese Government would make a profit of 66⅔ per cent. on every dollar paid them, with the trifling deduction of the expense of re-coinage, and condemned such an arrangement as unjust.

An account of the discussions which took place on this occasion is contained in the Report of the American Commissioners to Commodore Perry. It might have embodied some valuable information, which would have served as data to guide the American Minister on a subsequent occasion. Unfortunately it served only to confuse, and remains a specimen of false reasoning and bad English.

The matter remained thus until 1858, when Mr. Harris, sent as American Plenipotentiary to Japan, concluded, on the 29th July, a Treaty, of which the following is an extract:—

"All foreign coin shall be current in Japan, and pass for its corresponding weight of Japanese coin of the same description.

"Americans and Japanese may freely use foreign or Japanese coin in making payments to each other.

"As some time will elapse before the Japanese will be acquainted with the value of foreign coin, the Japanese Government will, for the period of one year after the opening of each harbour, furnish the Americans with Japanese coin in exchange for theirs, equal weights being given, and no discount taken for re-coinage.

"Coins of all descriptions (with the exception of Japanese copper coin) may be exported from Japan, and foreign gold and silver uncoined."

These stipulations have since been condemned by politicians, diplomatists, and financiers of more than one nation. They have been described by a high authority as "strange and anomalous, in violation of every principle of international law, and utterly unjustifiable both politically and financially considered."

The wholesale spoliation of the Government by foreigners was the inevitable result of such terms of barter, which were copied nearly textually into the Treaty of every other nation which obtained access to the country. The process was so simple and so easy. The merchant took his 100 dollars to the Custom-house and obtained for them token coins, weight for weight, *i.e.*, 311 ichibus; with this money he went into the market and bought gold kobangs to the value of between two and three times the intrinsic value of his dollars: he had only to send these kobangs to Shanghae and convert them back into dollars there, to recommence the operation. The gain to the foreigner and the loss to the Japanese was between 100 and 200 per cent.

The abuse carried its cure with it. The kobangs came to an end, or rather the silver tokens, of which from the very fact of their being tokens the supply was very limited, became exhausted. It was useless for foreigners to appear with their stupendous demands for ichibus, and point to the monetary Article of their Treaties; there were no bus to be had, or, at least, not a millionth part of what would have satisfied their demands. To have carried out such a stipulation for the space of one year, on such terms, would in any country in the world have been an impossibility.

It may be a matter of doubt whether the Japanese Government, when they consented to sign the Treaty with the United States, had not already devised a plan for which we can hardly believe them to have been blind. It was the opinion of Her Majesty's Representative here, at the time of the discussions which followed, that they had had such a plan in contemplation. Certain it is that when the first foreign settlers arrived in Japan in July, 1859, they found that means had already been prepared to meet the difficulty. A new silver coin had been put into circulation at the open ports of the denomination of a half-ichibu, but containing as much silver as an ichibu and a-half of the old currency, so that two of these coins were about equal in weight to a Mexican dollar. As the kobang still passed as 4 ichibus, it is evident that the foreigner, instead of obtaining the kobang for about $1\frac{1}{3}$ dollars, would have to pay nearly 4 dollars for it, which was about its true value.

A circular had at the same time been promulgated by the Govern-

ment, announcing to the inhabitants the issue of this new coinage, but informing them that temporarily, and until there had been time to recall the old coins, these latter would continue to circulate as before.

The measure was at once resisted as an infringement of the spirit if not the letter of the Treaties. The old token ichibus had not been recalled, they were to be found in the hands of native dealers in the open ports, and, moreover, the natives who received from the foreigner the new coins were, it was affirmed, compelled to take them back to the Custom-house and receive token coins in their place. How, it was asked, could coin which was struck exclusively for foreign use be termed Japanese coin? The whole thing was pronounced a clumsy contrivance to diminish the purchasing power of the dollar by two-thirds, to levy a tax on foreign trade of 200 per cent., and put the profit into the tills of the Government.

But was it contrary to the spirit of the Treaties that the Government should take means to reduce the purchasing power of the dollar to its true value (for they aimed at no more), and prevent a drain of their gold at a loss of nearly 200 per cent.? If so, then we can but conclude that the spirit and object of the Treaties were not the establishment of a fair and reciprocal trade, but the spoliation of the country and the alienation and hostility of its inhabitants. It might have been better had the Japanese Government actually called in the old coinage before the arrival of the foreigners; but it may well be questioned whether, with the very limited capabilities of their Mint, it would have been possible, in so short a space of time, to change the silver currency of a whole country, especially when it would have entailed increasing its intrinsic value three-fold.

But whatever the merits or demerits of this measure it was nipped in the bud by pressure from without. The new half-ichibus were recalled, and though on a subsequent occasion the question was again revived no result was obtained.

In the early part of 1860 another alteration in the currency was effected in the place of the former, at the instance of at least one Foreign Minister, who had long urged on the Government the adoption of some such comprehensive measure. Of the five gold kobangs which existed, the nominal value of the two most in use was changed from 4 to 13⅓ ichibus. The effect of this measure in arresting the export of gold was most satisfactory. But when it is reflected that the ichibu having thus lost its token value fell in a day to one-third of its former value, and that it carried with it the whole of the copper and iron currency, which maintained its former proportion to the ichibu, we cannot but see that the confusion and loss which must have occurred in every quarter of the Empire must have been tremendous. The effect to the foreign merchant was the same as what would have occurred had the original proposal of the Japanese Government been allowed; the dollar, it is true, now passed current in the open ports occasionally at 3 ichibus, but those ichibus possessed only one-third of their former value; the adoption of the other plan would have effected no more and no less, except indeed that it would have saved the nation

from a derangement of its currency as great and as sudden as it has perhaps ever fallen to the lot of any country to suffer.

Before the close of 1860 a new gold kobang was brought out, less than one-third of the value, both intrinsic and nominal, of those previously in circulation. Since then no further alteration has been effected in the currency.

On the 1st July, 1860, the year during which the Japanese Government were by Treaty compelled to exchange foreign coin weight for weight expired, and the rate of exchange immediately fell, until in September it reached the low figure of 200 ichibus to the 100 dollars. In consequence of the Government effecting large purchases at this low rate for the use of their Mint, dollars rose slightly, but for a long period they were quoted at from 230 to 250 ichibus per 100 dollars. It has been somewhat the custom to lay this depreciation of foreign coin at the door of the Japanese Government, and to assert that they placed impediments in the way of its free circulation. But this is an accusation which was never proved on the one side, and always denied on the other. It is, moreover, a fact that edicts were promulgated declaring the dollar current weight for weight, while the method was also tried of giving it freer circulation by stamping it with a Government stamp declaring its value to be 3 ichibus. The simpler explanation of fall was probably the truer one, viz., that the balance of trade being dead against foreign countries, their silver bullion had become comparatively speaking, a drug in the market, which was not required for purposes of manufacture, was not looked on with favour for hoarding, and was more than was wanted for the use of the Mint.

Nor was the low rate of exchange without its good effect upon trade. The operations of foreign merchants had at first been devoted too exclusively to deriving immediate advantages from a highly remunerative export trade, and they had given but little attention to forming a market for the manufactures of Europe. But with a large amount of dollars floating in the market at a discount, it soon became evident that the loss on them, which had been suffered in purchasing silk from the native, might be recovered by taking them back at the same rate in exchange for cotton. A rapidly increasing import trade was the result, and the result of this again was a rise in the exchange, until on one occasion the 100 dollars rose to 316 bus, or even more than their intrinsic value.

Only a few words need here be said on the exchange granted by the Japanese Government to the different foreign services. The use or the abuse of this privilege is now, and is likely to remain, a thing of the past. For several months the rate of exchange in the market has been as often above as below the rate at which the Japanese Government allow officials to convert their pay into ichibus at the Custom-house; and the English Diplomatic Service at all events has ceased to avail itself of it.

The system of notation in Japan is decimal, and most, though not all, of the weights and measures bear a decimal proportion to each other. In the coinage the decimal system has been neglected for one

which, though less convenient, is more natural; the silver coins have been halved and quartered; the copper have been doubled and re-doubled. But even here the decimal has been called in, as if to preserve the calculator from the difficulties of the other system, imperfectly developed: 96 is allowed to pass for the square of 10.

The writer of this Report has endeavoured to obtain as authentic data as were at his command. He has been kindly furnished by the Minister of Finance with information on several points. As an instance, however, of the facility with which errors may occur, it may be mentioned that between two of the specimens of the Japanese unit of weight supplied to him by the Government, and purporting to be accurate, there was a difference of exactly one-third of a grain troy.

The tables of weights and measures, and their English equivalents, vary in several particulars from those previously drawn up. The changes have not been made without consideration, and until repeated experiments had proved their necessity. The purely arithmetical calculations have been conducted with care, so that no error might creep into them. They have been based on the assumption that one Chinese tan or picul is equal to 133⅓ lbs. avoirdupois; that the English foot exceeds the Japanese kaneshaku by $\frac{1}{22}$ of an inch; that the Imperial gallon contains 138·637 cubic inches; and that 768 grains avoirdupois are equivalent to 700 grains troy.

Weights.

There is but one Table of weights in Japan. It is a compound of the Chinese monetary and commercial weights, the smaller weights being borrowed from the latter. It has been possible to effect this combination without confusion, in consequence of there being in the two Chinese scales a weight common to both, namely, the liang or tael, equal to 10 Japanese me or momme.

Below is a Table showing the weights expressed in their Japanese and Chinese names, with their corresponding values in English avoirdupois and troy weights:—

	Chinese Name.	Avoirdupois.	Troy.
		Drachms.	Grains.
10 mo equal to 1 ring... ...	Li or cash	·0213	·5824
10 ring equal to 1 fung ...	Fan or candareen	·213	5·824
10 fung equal to 1 momme	Taien or mace ...	2·13	58·24
4 momme equal to 1 riome	None	8·52	232·96
(10 momme equal to	1 liang or tael ...	21·33)	
		lb.	
160 momme equal to 1 king	Kin or catty ...	1⅓	
(100 king equal to	1 tan or picul ...	133⅓)	

The two lines in parentheses express the equivalent in Japanese weights of certain well-known Chinese weights which are much in use among foreigners in Japan. They have no existence as pure

Japanese weights, any more than hiakume, quamme, and two or three others which appear in most foreign works containing Japanese Tables of weights and measures. The only name by which the Japanese know the Chinese liang or tael is Jumme, literally 10 me or momme, in the same way as hiakume signifies 100 me, and quamme 1,000 me. To use them as individual weights sounds as absurd to a Japanese ear as it would appear to an Englishman if he heard the quantity 7,451 tons 3 cwt. 3 qrs. expressed as 7 thousand-tons 4 hundred-tons 5 ten-tons 1 ton 3 cwt. 3 qrs. The riome is used exclusively for weighing drugs.

If we inquire into the value of the Chinese liang or tael (equal to 10 Japanese momme), we find that it is reckoned as equal to 2,400 shu, or grains of millet; it is thus to the millet-seed that may be traced back the original unit of the Japanese weights, in the same manner as the barley-corn is the starting-point of the English long measure.

The following Table shows the approximate value in Japanese weights of the various denominations of the English avoirdupois and troy scales:—

Avoirdupois.

1 drachm equal to	·4695	momme
1 ounce equal to	7·5117	„
1 pound equal to	120·187	„
1 hundredweight equal to ...	13461	„
1 ton equal to	269220	„

Troy.

1 grain equal to	·01717	„
1 pennyweight equal to ...	·4121	„
1 ounce equal to	8·242	„
1 pound equal to	98·1	„

Measures.

Long Measure.—From the nomenclature as well as from some of the proportions of the Japanese ordinary measures of length, it is evident that it was originally derived from the Chinese. But as, according to Dr. Roudot, the Chinese unit of length, the chih, varies to such an extent in different parts of the Empire that there are no less than eighty-four different values of it, varying from 9·92 to 15·769 inches, it is not to be wondered at that there is no one of them which exactly corresponds to the integer Kaneshaku or metal foot of Japan.

The following is a Table of the Japanese long measure, or carpenter's measure, as it is often called, with the English values of each division.

1 ring	=	·011954 inches or	·000996 feet.
10 ring = 1 bu	=	·11954 „	·00996 „
10 bu = 1 sung	=	1·1954 „	·09962 „
10 sung = 1 shaku	=	11·954 „	·9962 „
6 shaku = 1 keng	=	... ...	5·9772 „
60 keng = 1 choo	=	... ...	358·636 „
36 choo = 1 ri	=	12910·9 feet or ...	2·4452468 miles.

Below are the Japanese equivalents of the principal English measures.

1 inch	=	·08378	shakus.
1 foot	=	1·005362	„
1 yard	=	3·016086	„
1 pole	=	16·588473	„
1 furlong	=	663·539	„
1 mile	=	5308·312	„
1 geographical mile	=	6119·304	„
1 degree	=	367158	„ or 28·330111 ri.

The Japanese long measure is not arranged with any reference to the earth's axis or circumference, having existed in its present form previous to any precise knowledge on the subject having been arrived at. It was from the Dutch that the Japanese later acquired the idea of the division of the earth's circumference into degrees.

Cloth Measure.—Though this measure somewhat resembles at first sight the ordinary long measure, the two are not identical in any respect, inasmuch as the Kudjiradjaku, or Whalebone shaku, which is the unit of the former, is equal to $1\frac{1}{4}$ shakus of the latter.

The following are the divisions of this measure, with their English equivalents:

10 bu = 1 sung = very nearly $2\frac{1}{2}$ inches.
10 sung = 1 shaku = very nearly $1\frac{1}{4}$ feet.
10 shaku = 1 djoo = very nearly $12\frac{1}{2}$ yards.

Superficial Measure.—The integer of this measure is the Kanedjaku, or metal shaku, with which we have already had to deal. Its multiples, and the value of each are as follows:—

1 square shaku	=	·99244	square feet.
36 shaku = 1 tsubo	=	35·72784	„
30 tsubo = 1 se	=	107·185	„
10 se = 1 tang	=	1071·84	„
10 tang = 1 choö	=	10718·4	„ or nearly ¼ of an acre.

Below are given the values in Japanese measurement of the principal English measures.

1 sq. foot =	1·010748	sq. shaku or	·028076 tsubo.
1 sq. yard =	9·09675	„	·25268 „
1 sq. pole =	295·6443	„	8·2123 „
1 rood =	... ...		305·75 „
1 acre =	... ...		1223 „
1 sq. mile =	... ...		782725 „

The Japanese occasionally make use of the mat as a mode of measurement; the mats are invariably of the same size, viz., six shaku (feet) long by three shaku wide. A Japanese house is generally so constructed that the floor of each room can be exactly covered by a larger or smaller number of these mats which serve as a carpet.

Solid or Liquid Measure.—The names and proportions of the various divisions of this measure are almost entirely derived from the Chinese. Their values, however, vary, nearly in the proportion of 10 to 6; while the smallest Japanese measure contains 1,000 grains of millet, the corresponding Chinese measure contains but 600 grains.

The following Table gives all the Japanese measures of capacity with their corresponding Chinese names and their respective values in English cubic and Imperial liquid measurement.

10 sai	= 1 shiyaku (choh) =	1·1075 cubic inches.		
10 shiyaku	= 1 ngoö (koh) =	11·075	„	or ·3195 pints.
10 ngoö	= 1 shoö (shing) =	110·75	„	or 3·195 „
10 shoö	= 1 to (tau) =	1107·5	„	or 3·9942 gallons.
10 to	= 1 koku =	6·409 cubic feet		or 4·9928 bushels.

The Japanese standard measures as well as those in common use, are rectangular, the bases being square. The exact size of the shoo which is the unit of the scale is sung 4·9×4·9×2·7 Reckoning the sung at 1·1,954 inches, the shoo contains 110·75 cubic inches, as above.

The revenues of the great Princes or Daimios of Japan, even though partially paid in money, are measured in kokus of rice. Thus, the revenue of the Prince of Satsuma is computed at 760,800 kokus, and that of the Prince of Mito at 350,000 kokus. Titsingh (A.D. 1780) represents the koku of rice to correspond in value to the gold coin called a kobang, the value of which was 18s. 4½d. Carow, who lived in the previous century, gives as the current value 10 guilders, or 16s. 8d. Sir Rutherford Alcock valued the koku at 13s. 10d. Rice has since then risen so much in price that a koku is now valued at 9 rio or £2 11s.

The total annual revenues of all the great landed proprietors of Japan were, according to Carow, computed to amount about the middle of the seventeenth century to 28,345,000 kokus, or about 4,500,000 of tons. The official returns on which this calculation was based are, however, to be little relied on; they were drawn up in the beginning of the seventeenth century, and have been but occasionally altered since. Even when first prepared they were often far from correct, for where the rent was paid in coin the koku was frequently reckoned at an absurdly low figure, in order to swell the apparent revenue of the proprietor. The temptation to such over-valuation is apparent, when it is remembered that, in Japan, revenue confers rank and its corresponding privileges. One of the highest rights of the Japanese noble, that of personal audience of his Sovereign, depends on his having the required income; only Daimios, possessing a revenue of not less than 100,000 kokus of rice are admitted to the Mikado's presence; the Emperor cannot countenance poverty.

The koku is further employed in the measurement of vessels, the calculation of crops, the assessment of taxes, and the imposition of fines.

Recent Discovery of Arctic Land.

Discoveries of land in the Arctic Seas remind us of the days of Parry, and all the expeditions which went in search of unfortunate Franklin, commencing with Ross and ending with McClintock. Those expeditions however, belong to the approach to those seas, either East or West of Greenland; and with the exception of one from Spitzbergen by Parry, went through Baffins Bay. We have now however, an interesting account of land found by whaling ships (principally American), in the approach (as we may call it) to the Arctic Sea from Behring Strait. Those whalers, it appears, have penetrated as far north as 73° N. lat., in about 173° W. longitude, a part entirely out of the track of all former navigation.

In the chart published by the Hydrographic Office of the Admiralty, on the meridian of about 178° W. and lat. 71° N., are laid down a series of high mountains, along with Herald and Plover Islands, the result of the discoveries of the present Admiral Kellet, when he commanded the former of these vessels and was sent to the Arctic Sea to assist in the search for Sir John Franklin. This same land, which it appears had been supposed to exist there since the time of Wrangell's Siberian expedition, is the same that has just been realized by these American whalers; and more especially by Captain Long in the barque *Nile*. Arriving at the Sandwich islands in October or November last, the account of his discovery appears in the best paper published at Honolulu, and which account we insert here, along with the remarks of that journal.

Besides Captain Long's account another appears from Captain G. H. Craynor in the same paper, whose statement of the S.E. Cape of this land differs as much as thirty miles of latitude, and 2° 11′ of longitude from that assigned to it by Captain Long. Such differences are to be regretted, although to be expected; and it is to be hoped we shall not be long without being set right in this matter.

In respect of the extent of this land, which we have considered as being really situated only at the entrance, instead of the "middle" of the Arctic Sea, it is not even so far north as New Siberia, which reaches to 76° North latitude; and the furthest north we know a whaler to have been in that neighbourhood is in about 73° 2′ N. in 173° West.* But there can be no doubt that an archipelago of islands would be found between this position and the pole, extending East and West in the same manner as the islands between Grinnel Land and Prince Patrick island, N.W. of Melville. And should such an assemblage of islands hereafter be discovered, how far are they yet from the pole itself. At the same time far as this may be (even to six hundred miles) the tendency of the current shews this to be the most likely direction from which an expedition could approach the pole.

* The report of the whaling ship *St. George* states, that in the course of the past summer she has been as far north as 78° 10′ in long. about 173° West.

Parry was exactly on the opposite side of the pole from Spitzbergen, and was within four hundred and thirty miles of it when he relinquished the attempt to reach it, drifting daily as he was to the southward but which drift would have been in his favour if he had gone from Behring Strait. A north-west current evidently prevails along this new land, nearly in a direction with which (was no land in her way) a ship might possibly by drifting and manœuvreing be enabled to reach the pole itself, and if she could get shelter from land might even harbour there and accumulate invaluable observations. A field is evidently here open for exploring, which in the nautical chivalry and adventure of former days would have inspired the ardour of our naval officers to heroic deeds, backed as it was by an encouraging government. But as the Pacific is so thoroughly American, and the road to the enterprise lying as it does through Behring Strait, we suppose it must be left to the energies of American seamen to complete what so many British seamen have begun.

The foregoing might wear the appearance of an attractive scene for active navigators;—but they know full well how actual scenes, perhaps even more attractive than that because they are real, and as Parry himself has said, with not a vestige of ice about them, are soon, very soon past and gone. That polynia too or open sea, so *warmly* advocated by some, might one day present such a scene and the next day another of icebergs and floes. Archipelagoes of islands doubtless there are in this polar basin; but what we may be pretty certain of is, a current through their channels, always tending towards the outlets from it to the Atlantic Ocean—for the Pacific has no want of such supply of Arctic ice or water from the numerous rivers that are discharged into it along the northern shores of Asia and America. But we will leave our speculations with the motto, *l'homme propose mais Dieu dispose.*

But here is the account to which we have been alluding:—

One of the most interesting items that we have learned from the whalemen, who have cruised in the Arctic Ocean the past summer, is the discovery of extensive land in the middle of that ocean, which may yet prove to be a Polar Continent. The existence of this land has long been known, but owing to the impassable ice barrier along its shores, of its extent and character nothing very definite has been known, until this season. Baron Wrangell, the famous Russian explorer, first communicated to the world the knowledge of its existence, as he learned it from the Siberian Indians, and it is simply marked on most Arctic charts "extensive high land."

It should be stated that the past summer has been the mildest and most favourable for whaling ever known by our oldest whalemen. One master says that he did not see a piece of ice as large as his hand till he reached the straits, and even beyond that, up to 72°, the sea was generally free from floating ice. The weather, for the most part, has been exceedingly mild, with southerly winds prevailing, which have tended to melt the ice or drive it northward. As a result of the favourable state of the ocean and weather, the ships have gone farther

north this summer than ever before, some having reached as high as latitude 73° 30′.

Captain Long, of the barque *Nile*, who seems to have examined the land most attentively, having cruised along the entire southern coast, has drawn a sketch of its appearance. It is quite elevated, and near the centre has an extinct crater cone, which he estimated to be 2,480 feet high. He named it *Wrangell's Land*, after the noted Russian explorer. The West point he named Cape Thomas, after the seaman on his ship who discovered it, and the S.E. point, Cape Hawaii.

The names given by Captain Long are so exceedingly appropriate, that we doubt not the Geographical Societies of Europe and America will adopt them and call this land "Wrangell's Land." Captain Long has prepared for us an account of this interesting discovery, which we insert here:

HONOLULU, November 5th, 1867.

H. M. WHITNEY, ESQ.:—SIR—During my cruise in the Arctic Ocean this season, I saw land not laid on any charts that I have seen. The land was first seen from the barque *Nile* on the evening of the 14th of August, and the next day at half-past nine o'clock a.m., the ship was eighteen miles distant from the west point of the land. I had good observations this day, and made the west point to be in latitude 70° 46′ north and longitude 178° 30′ east.

The lower parts of the land were entirely free from snow and had a green appearance. as if covered with vegetation. There was broken ice between the ship and land, but as there were no indications of whales I did not feel justified in endeavouring to work through it and reach the shore, which I think could have been done without much danger.

We sailed to the eastward along the land during the 15th and part of the 16th, and in some places approached it as near as fifteen miles.

On the 16th the weather was very clear and pleasant, and we had a good view of the middle and eastern portion of the land. Near the centre, or about in the longitude of 180°, there is a mountain which has the appearance of an extinct volcano. By approximate measurement I found it to be 2,480 feet high.

I had excellent observations on the 16th, and made the south-eastern cape, which I have named CAPE HAWAII, to be in latitude 70° 40′ north, and longitude 178° 51′ west. It is impossible to tell how far this land extends northward, but as far as the eye could see ranges of mountains until they were lost in the distance; and I learn from Captain Bliven of the ship *Nautilus* that he saw land north-west of Herald Island, as far north as latitude 72°.

The first knowledge of the existence of this land was given to the civilized world by Lieutenant Ferdinand Wrangell, of the Russian Navy (who I find in 1840 was an Admiral in the same service). In his expeditions from Nishne Kolymsk in the consecutive years from 1820 to 1824 he obtained information from Tschuktschi that in clear days in the summer season they could see land north from Cape Jakan.

In an interview with the *hamakai* or chief of one of the Tschuktschi tribes Wrangell says:

"When I asked him whether there was any other land to the north beyond the visible horizon, he seemed to reflect a little, and then said that between Cape Erri (Schelagsko) and Cape Ir Kaipij (Cape north) *there was a part of the coast, where from some cliffs near the mouth of a river, one might, in a clear summer's day, descry snow covered mountains at a great distance to the north, but that in winter it was impossible to see so far.*

"He said that formerly herds of reindeer sometimes came across the ice of the sea, probably from thence, but that they had been frightened back by hunters and wolves; that he had himself once seen a herd returning to the North in this way in the month of April, and that he had followed them in a sledge drawn by two reindeers, for a whole day, until the rugged surface of the ice forced them to desist. His opinion was (in which I coincide) that these distant mountains were not on an island, but on an extensive land similar to their own country. He had been told by his father that a Tscuktschi Elder had once gone there with a few followers in large *baidars*, or boats made of skin, but what they found there, or whether they ever returned, he did not know.

"Still he maintained that the distant northern land was inhabited, and adduced in proof of it that some years ago a dead whale had been found at Arautan Island, pierced by spears pointed with slate, and as the Tschuktschi do not use such weapons, he supposed that the whale must have been wounded by the inhabitants of the northern land.

"I thanked the old man for his readiness in answering all our questions, and made him a handsome present, promising at the same time that if his information proved to be well founded, the government would not fail to reward him bountifully. He was extremely grateful, and entreated me to get the Emperor to send him an iron kettle and a sack full of tobacco, which he said would make him completely happy."

In connection with this I will make another quotation from his journal. On the 8th of April, 1823, he says, being then near Cape Jakan: "We gazed long and earnestly on the horizon in hopes, as the atmosphere was clear, of discovering some appearance of the northern land which the Tschuktschi affirm they have seen from this place, but we could discover nothing of it."

From the appearance of the land as we saw it, I feel convinced that *it is inhabited*, as there were large numbers of walrus in this vicinity, and the land appeared more green than the main coast of Asia, and quite as capable of supporting man as the coast from Point Barrow to the Mackenzie River, or the northern parts of Greenland, which are in a much higher latitude.

There is a cape a little to the westward of Cape Jakan, which has a very singular appearance. On the summit and along the slopes of this promontory there is an immense number of upright and prostrate columns—some having the appearance of pyramids, others like large obelisks; some of them with the summit larger than the base. The

character of the surrounding country, which was rolling, with no abrupt declivities, made these objects appear more singular. They were not in one continuous mass, but scattered over a large surface, and in clusters of fifteen or twenty each, with intervals of several hundred yards between them.

While at anchor near this place, Captain Phillips, of the *Monticello*, came on board and drew my attention to a large black place on the slope of one of the hills, and said he thought it was *coal*. We examined it with the telescope, and it had a very distinct appearance of coal. It glistened in the sun, and appeared like a large surface which had been used as a deposit for coal. It was about one and a half miles in length and one-half mile in breadth, the country surrounding it being covered with vegetation.

From 175° to 170° East there were no indications of animal life in the water. We saw no seals, walrus, whales, or animalculæ in the water. It appeared almost as blue as it does in the middle of the Pacific Ocean, although there was but from fifteen to eighteen fathoms in any place within forty miles of the land.

I think the positions I have assigned to this land will be found correct, as Mr. Flitner examined my chronometer on my arrival and found it only one and a half miles in error.

I have named this northern land *Wrangell's Land*, as an appropriate tribute to the memory of a man who spent three consecutive years north of latitude 60°, and demonstrated the problem of this *open Polar Sea* forty-five years ago, although others of much later date have endeavoured to claim the merit of this discovery.

The west cape of this land I have named *Cape Thomas*, from the man who first reported the land from the mast-head of my ship, and the south-eastern cape I have named after the largest island in this group.

As this report has been hurriedly prepared, I would wish to make more extended observations on the subject, which may be of benefit to other cruisers in this direction, if you will allow me room in your paper on some future occasion.

Yours very truly,
THOS. LONG.

The next interesting inquiry relates to its extent, As near as we can learn, after diligent inquiry, no one landed anywhere on it, though several vessels coasted within a few miles of it. The southern shore runs a distance of about one hundred miles East and West. How far it extends North is at present only a matter of conjecture.

Captain Bliven, while cruising near Herald Island, north latitude 71° 20′, west longitude 175°, and distant about eighty miles from the south-east point of Wrangell's Land, saw the mountain range extending to the north-west as far as the eye could reach. He thinks it not improbable that it extends north several hundred miles. If so, it would appear to be of great extent, perhaps sufficient to be termed a continent. By taking a chart of the Arctic Ocean, and marking the

land from the points named above, it will be found to lie about seventy miles distant from the Siberian coast. The straits between the two shores are usually blocked with ice; but this season they have been quite clear. Captain Long thinks that a propeller might readily have steamed far up north either on the west or east side of this land, and made full directions regarding its extent and character.

These are all the facts that have thus far been elicited regarding what must be conceded to be one of the most important discoveries made the present year, and which will doubtless prove to be an interesting addition to geographical knowledge. The fact that verdure was seen by Captains Long and Phillips, and that reindeer exist on it, favour the supposition that it is inhabited. Along the shore, drift-wood was seen floating in the water, which is supposed to have come from the contiguous land.

It is well known that a committee including some of the most noted French savans has recently been formed in Paris, for the purpose of organizing a new expedition to the North Pole. It is stated that the route to be pursued is one discovered by a French hydrographer, M. Gustave Lambert, and has not yet been tried by previous explorers. A subscription has been raised for the expenses of the proposed expedition, which are estimated at 600,000 francs at least. The Emperor has shown his confidence of the undertaking by heading the list of subscribers with 50,000 francs. This new route is understood to be *via* Behring Straits and the "Sea of Polynia," which is probably a new French* name for the Polar Sea.

Hitherto all expeditions sent out from the Siberian coast have failed to penetrate north farther than latitude seventy-two. Should the remarkably mild weather continue another season, or should the winter be not unusually severe, the summer of 1868 may prove to be as favourable for researches in this quarter as the past summer has been. A strong propeller could in thirty days this year have gathered more information about the Arctic than all the expeditions yet sent out. We sincerely trust these facts will spur the efforts now being made to organize new expeditions, and settle more definitely the character of the open Polar Sea.

The following letter from Captain Craynor contains some additional particulars, relating to the northerly current past Herald Island, a circumstance noticed by several masters, and which tends to confirm the opinion that the newly-discovered land extends some distance to the north. In the channel north of Herald Island, the sea was clear of ice as far North as the eye could reach from the vessel that went farthest into it.

HONOLULU, November 1st, 1867.

MR. WHITNEY,—SIR—In compliance with your request, I send a short account of a large tract of land, lying in the midst of the Arctic Ocean, hitherto but little known. This land has heretofore been con-

* It is a native name mentioned by Wrangell.—ED.

sidered to be two islands, one of which is marked on the English charts as Plover Island, which is laid down to the W.S.W. of Herald Island. The other is simply marked "extensive land with high peaks." On my last cruise, I sailed along the south and east side of this island for a considerable distance three different times, and once cruised along the entire shore, and by what I considered reliable observations, made the extreme south-west cape to lie in north latitude 75° 50′, and east longitude 178° 15′. The south-east cape I found to lie in north latitude 71° 10′, west longitude 176° 40′. The south coast appears to be nearly straight, with high rugged cliffs and entirely barren. The north-east coast I have not examined to any extent, but it appears to run from the south-east cape in a north-westerly direction for about fifteen or twenty miles, and then turns to the north and north-east. I learned from Captain Bliven that he traced it much farther north, and has seen others who traced it to north of latitude 72°. I think there is no doubt that it extends much further to the north, and that there is another island lying to the east of it, say in longitude 170° west, and to the north-west of Point Barrow, with a passage between it and the land I have just described. My reason for thinking so is this: We always find ice to the south of the known land, farther to the south than we do to the eastward of it. The current there runs to the north-west, from one to three knots an hour. In the longitude of 170° west, we always find the ice barrier from fifty to eighty miles further south than we do between that and Herald Island, and there is always a strong current setting to the north-west between those localities, unless prevented by strong northerly gales (for in such shoal water as the Arctic Ocean, the currents are changed easily by the winds), which would indicate that there is a passage in that direction, where the waters pass between two bodies of land that hold the ice, the one known, the other unknown.

I would add that the S.W. cape of this island described above, lies seventy-five miles distant from the Asiatic or Siberian coast.

Yours, etc.,
G. W. CRAYNOR,
Master of the ship *Reindeer*.

The American Editor adds in conclusion: "The article on the new Polar Continent discovered in the middle of the Arctic Ocean should be read by all. The existence of this land has long been vaguely known, but it *has never yet been explored*. If it possesses verdure, and reindeer, walrus, seals, etc., as the letters published would indicate, it *must be inhabited*. Here is a new field for ambitious explorers to earn a fame not often offered to them. And it will not now remain long before it will be explored."

Notes During a Voyage between England and the Black Sea.

(Continued from page 10.)

While the "Blue Peter" is flying at the fore, and our boat is alongside the Admiral's ship waiting for sailing orders, let us take a look back at one or two scenes of the celebrated siege of Sebastopol before losing sight of a battle field, on which many a brave man and good soldier fought his last fight. There are many incidents of the Crimean war, which will have a place in the military annals of England, while a sailor's casual notes can be but very fragmentary and of very small account.

I was in the advanced trench one day to see a soldier about whom I was interested, when three Russians shewed themselves from under cover, and after a score of muskets had been fired at them through loop holes that killed two out of the three, I was struck with the cool way in which our soldiers disputed as to who had been the lucky shot, much in the same way as sportsmen who happen to have fired at the same bird. Yet, perhaps, the day before, when there had been a few hours truce to bury the dead, all these men, not only those who fired but those who were fired at, were smoking their pipes together most harmoniously, and shaking hands like brothers! My soldier friend was one of the Hedley Vicars kind—pious and brave, and after getting into conversation with him for a little time I ceased to hear the thud of the bullets against the trench, and their perpetual whizz overhead, although these unpleasant sounds were new to me; so soon does the mind accommodate itself to any altered conditions even when an element of danger is present.

One of the strange sights of the siege occurred the day after the capture of the place, when the plunder (such as it was) was carried off. The Russians had long before prepared for abandoning Sebastopol, and retreating to the north side of the harbour, they had time to remove everything valuable and to nearly strip the place. Still there was a small harvest for gleaners, and long strings of them might be seen filing out of town loaded with as odd a collection of articles as can well be imagined. The French soldiers are said to be very expert at looting, and I noticed some of them to be carrying a very uncomfortable amount of top hamper. One in particular was so loaded that he could neither steer nor make head-way, but staggered about like another sort of people who have taken more than they can carry. On his head was a copper, full of all sorts of things belonging to a kitchen, conspicuous among which was a Dutch oven with its legs sticking up in the air. He had slung from his neck a kitchen clock, two fryingpans, and a gridiron, a string of small saucepans round his waist, and his equipment was completed by a spit as long as an Arab spear and slung across his back after the same style. In company with this greedy plunderer was a comrade who had lighted on higher

game. This man's load was an antique arm chair of curious make, which he carried on his head, and two handsome chairs with crimson seats, one on each shoulder; and not to fail in having a full load, he had in addition a quantity of yellow curtain fringe somewhere about twice as long as a deep sea lead line only not so well reeled up, as a bit of it was dragging in his wake. I never saw two figures less like soldiers in my life, and indeed the whole squad of looters presented a very sorry picture. Having one of my seamen with me I had the antique chair transferred to his shoulder at the moderate cost of five shillings; and just afterwards I came upon a party of tars belonging to the Naval Brigade, carrying a church bell, which of course they were ringing for their amusement, and which they would have sold to any individual, French, Russian, or Turk, for a bottle of rum and a pound of tobacco each man, although the bell was worth a hundred pounds or more.

An event showing how the Russian riflemen kept a sharp look-out occurred to me in the French trenches, where I happened to be when there was no firing going on. Just after entering the trench I met the French Commander in Chief, General Canrobert, with four officers, and what struck me was that neither the General nor one of the officers with him could speak English. He requested to see my pass, which I handed to him, signed by our Adjutant General, and which he *vizéd* at the suggestion of one of his staff, and I then passed on alone, here and there seeing a sentinel at long intervals and all as still as a quarter-deck in the middle watch. I had turned the east angle of the trench and wishing to see if I could make out the Russian lines before returning, I stood up on the raised way about breast high above the parapet, and before I had time to see anything a bullet whizzed close to my ear, and a second struck the top of the parapet the instant after I had stepped down. There was but the interval of a second between the two shots that saved me from the Russian rifleman's good aim. The warning was enough, and I soon left the place without any more curiosity about the enemy's lines, and when one of the guard brought my horse to me just outside the trench, the narrow escape I had had, from being taken down to my ship in another manner than on horseback was a very pleasant reflection, and the sound of a bullet remained with me during all my ride to the harbour.

When the intelligence reached the Crimea of the death of the Czar Nicholas, there was a general feeling that the war would not last, and whatever may be the love of soldiers for their profession, I don't think there was a man in the whole besieging force, French, English, Piedmontese, or Turkish, who was not glad to think that it would soon be over; and although it had been a fine field for promotion this was pretty well worked out and all were wanting to get home again.

Our boat returned with the order to sail for England, and an hour afterwards we were sailing out of Balaclava Bay with a fair wind and light hearts homeward bound. We were only one short of our muster roll, and that was one of our best seamen, who had died of

cholera, nothing was left untried to save him and I gave him the prescribed medicines myself to keep panic away and to encourage the crew. Still nothing availed to arrest the terrible disease for an instant, and I am persuaded that there are cases of the kind that no human remedies can prevent from ending fatally. Another seaman seized at the same time, and who appeared at first as bad as he was who died, recovered, although he was a much less robust man than his messmate. Strange as it may seem I feel certain that there are such phenomena as *choleraic clouds or meteors*, and that the presence of this baleful matter in the atmosphere at certain times and places, will be detected much in the same way as the presence of ozone has been discovered.

Some of the readers of the *Nautical Magazine* will remember the black cloud "like a pall" which was observed to hang over one of our line of battle ships in this expedition just before the cholera broke out on board of her, and which carried off a number of the crew. "The blue cholera mist" which occupied the attention of scientific and medical men in England a year ago points to the same conclusion, and indeed it is hard to doubt that there are times and places in which poison is taken in with the air we breathe, not only as is well known in miasma localities, but in places where the normal condition of the air is healthful.

On the fourth day after leaving Balaclava Bay we sighted the entrance of the Bosphorus at a distance of five or six leagues. The land on each side when seen from the N.E. appears of equal height, but on looking inland there is seen higher land on the left or Asiatic side: this higher land is composed of a double hill or mountain called the "Brothers," and whenever seen will be found a useful mark for ships approaching the strait from the Black Sea. The practice of keeping along this coast to avoid missing the entrance ought not to be considered necessary in clear weather, as it can be seen at such times twenty miles off, and it is not a good practice at any time to be nearer the land than the occasion requires.

Beating through the Bosphorus is fine practice for both ship and crew, and it is one of those sights which are apt to make us think how the general use of steam by all maritime nations has lessened the relative skill of English sailors, as well as rendered defective the actual nautical training of a large part of our sea-going class, both in the Navy and the merchant service.

We anchored at Constantinople and remained there for three days, which gave us time among other things to visit the wounded in the hospitals at Scutari, and to see a number of devoted women who had given up all the comforts of home, nursing the poor fellows like mothers and sisters. Among them I had the pleasure of being introduced to Mrs. Bracebridge and Miss Nightingale, but it ought not to be forgotten, that there were others as devoted to the good work as they were.

Our ship was visited on the same day by Byron's "Maid of Athens" and her husband with their beautiful daughter, and Mr. Bracebridge (who had charge of Miss Nightingale on her voyage from

England). I have never entertained a party on board ship with greater pleasure, and after giving them a pull out into the Sea of Marmora landed them at Scutari, with a feeling of regret expressed by all that we were not to meet again.

I made another visit to St. Sophia's, and as I looked up at that FIGURE OF CHRIST, which seems to be indestructible, I heard as it were a voice, which said,

I know the *burden* of *thy* song,
With which thou comest to this shrine,
It is—"How long! O Lord, how long!
Be here invoked a name not Thine!"

And surely such a voice must have sounded in the ear of many a pilgrim to this desecrated shrine, where once stood the High Altar of Christianity in the East, and from which the blessed Gospel was spread over the land. *But* is there not a voice heard even sadder than this at the great shrine in the West—sadder, because it professes to be what St. Sophia lays no claim to be—The House of the Lord. Is it too much to say, that the Gospel is as little preached at St. Peter's as at St. Sophia's, or that, as in what was once the Metropolitan Church of the East, Mahomet's name is chiefly invoked, so in what is claimed to be the Metropolitan Church of the West, the Name chiefly invoked there is not the "Name of the Lord" but one with no more power than that of Mahomet?

W. C. P.

NEW BOOKS.

THE ELEMENTS OF MARITIME INTERNATIONAL LAW, *with a preface on some unsettled questions of public law. By William DeBurgh, B.A., of the Inner Temple. London: Longmans*, 1868.

AT the present moment, and in the present condition of public affairs, this may be considered a well timed work, and one no less important in reference to the treatment of the subjects which it contains. We have been already told by a volume to which we alluded in our last number, that, our Maritime law, as far as it concerned commercial intercourse with foreign countries, very much required revision, and in this work before us it is not difficult to perceive that our maritime international law is much in the same condition. This it was painfully evident to the best friends of this country, was not sufficient to prevent the building in this same land, and the surreptitious equipments from it, also, of such vessels as the *Alabama*, the *Rappahannock*, and a variety of others, with blockade runners ad infinitum, to shew the northern section of the people of the United States, not only the feeling of another large section of people in this country, but also the way in which *they* would observe the part of *Neutrals* in the war of the Southern rebellion, and also the total inefficiency of our boasted "Foreign Enlistment Act" to prevent such proceedings as did take

place. But we must not trust ourselves to allude further to these proceedings, from their commencement to the gallant behaviour of the *Kearsage* off Cherbourg towards the end of the struggle between the North and South, or the well merited fate of our *Cotton bondholders;* for the object of the work before us has claims far more worthy of our attention than those subjects, on our limited space, and we trust that it will contribute to place us in as good a position hereafter, as the Americans are in as to observing the laws of Maritime Neutrality.

With the view therefore of promoting the worthy object of Mr. De Burgh in making his work known, we shall describe the different heads into which he has divided his subject, premising that he has opened it with a most important preface "on some unsettled questions of public law" which it would be well for our public lawgivers to consider closely. He then gives separate chapters on, "1. International Maritime Law; 2. Enemy's character and domicile; 3. Trading with an enemy; 4. Sailing under an enemy's flag or Pass; 5. Ships' Documents; 6. Contraband of war; 7. Blockade; 8. Procedure in case of prize: 9. Jurisdiction of Courts." On all and each of these subjects our author has dilated, quoting an abundance of cases of vessels bearing on them, to which he has added a good index and just remarks. We will close this notice with the following points which our author has traced out for consideration. These are—

1. "The more careful observance of the *principle* of reciprocity, and the usage of nations; and acting in a larger spirit on the maxim of *good faith*, rather than on a strict construction of municipal enactments, such as, for example, the Foreign Enlistment Act."

2. "Without imposing undue restrictions on the freedom of individual merchants, or the enterprise of private citizens, to make the Government so far associated with and responsible for their acts, as to oblige it to interfere when the transactions of such persons as pass the limits of fair trade, and endanger the national neutrality. And as collateral to these."

3. "To adopt the principle proposed and rejected at the conference of Paris, that all private property at sea should be respected and exempt from seizure and confiscation, except it be taken in the act of breaking a blockade or consists of articles notoriously contraband of war."

Such points are indeed worthy of our consideration and better observed we may add by the people of the United States than by ourselves. Mr. De Burgh's book will be well and deservedly consulted.

CORRESPONDENCE.

To the Editor of the Nautical Magazine.

SIR,—You do well in the interests of humanity and national honour, to bring before your readers any facts connected with the condition of the Abyssinian Captives tending to inspire unwearied exertion for

their release; but the letter of Doctor Blanc, copied from the *Bombay Gazette*, implies some contradictory circumstances. He speaks of being "chained by the leg," yet of "*building huts.*"

"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!" Immediately after comes the sentence, "Our chains are no fun, however, disagreeable things." Can chained captives build better huts for their accommodation? and one of these captives though favoured "with a lighter ring invented by the former head gaoler," be so free as to obtain, either by his own constructive skill, or by other assistance, as *good* a house as can be found in Abyssinia." It seems most painfully difficult to arrive at the truth, even from the sufferers themselves; and on what then can a judgment be formed?

Yours faithfully,

AN ENQUIRER.

January 19th, 1868.

SIR,—I have read with interest your recent appeal to all the respectable classes of the community on behalf of the Queen Adelaide Fund, and having become a member of the Ladies' Committee, as well as a Subscriber from the formation of the Charity, I beg leave to bear witness to the great importance of the aid it has afforded to the education of orphan daughters of Naval Officers, as well as to the relief of their distress. It is proposed to designate a certain number of scholars at the Royal Naval School at Isleworth, as "Queen Adelaide Scholars," but I propose through the medium of "*The Nautical*," as I have done to the Honorary Secretary, who has succeeded to the position of the lamented Mr. Skyring, that the words "On the *Skyring Foundation*" should be superadded to the above designation; thus establishing the fact of the *origination* of the Fund by the unwearied exertions of Mrs. Skyring and her son, and removing all excuse for the erroneous inference which would certainly arise hereafter, that the Dowager Queen had by her own bounty established the so-named scholarships. To your justice I commend this suggestion, remaining,

Yours faithfully,

A Member of the Ladies' Committee of the Q. A. N. F. since 1849.

[The proposal of the "Member of the Ladies' Committee" appears to us both just and proper but must remain for future decision. On the general subject of the "Queen Adelaide Fund" we have just learned with much satisfaction that in the list of its Vice-Presidents the name of Admiral Sir Alexander Milne, K.C.B., Senior Naval Lord of the Admiralty, has been enrolled.—ED. *N.M.*]

Notes on Novelties.

The Novelty papers of our last Number were concluded with some remarks on the great Pacific railway of the United States, in which ease and elegance seem to be determined on in that gigantic undertaking: such an account as there given, speaks of things unheard of in the old country, as the people there have it, and certainly so lengthened a journey, as some thousands of miles on the rail does need some more than ordinary attractions for passengers. It will thus be something new to go round the world in perhaps under three months. We have not yet met with the time in which it would be done, but perhaps the foregoing might not be far wide of the mark.

While on the subject of rail across the American Continent, it appears that some remarks made in our last January Number appear to be borne out by the following extract from a New York paper, which says concerning the rail road:—

"A treaty has been made between the United States and Nicaragua, and is on the way to Washington, and that the building of a railway across Nicaragua is regarded as more of a problem than ever, as is proven by the surveys which have been held."

We have heard somewhere that the people of the United States have an invincible desire to keep all American railway work to themselves, as they have done the Panama line. American capital and American work they consider belongs to them.

Before we leave the Pacific we must record a reported discovery in the Arctic Ocean northward of Behring Strait by an American whaler, which vessels are accustomed to pursue their calling in the Arctic Sea. It is no less than a discovery of land, in point of latitude not far north, but still further north than our navigators have gone in the longitudes of Behring Strait. Nothing was more probable than that land should be found where it has been discovered, and if our memory serves us right, was suspected by Captain Kellett in the *Herald* in 1849, when he visited those shores in search of Franklin and his unfortunate party. The report originated in the *Honolulu Advertiser*, which gives an account of the discovery of land, hitherto unknown, in the Arctic Ocean, by Captain Long, of the whale ship *Nile*. The past season has been the mildest which has been experienced by the oldest whalemen, and Captain Long was able to reach latitude 73° 30′. He examined the land attentively along its entire southern coast, which he sketched. It appears to be quite elevated, and has a mountain near the centre about longitude 180°, resembling an extinct volcano, and estimated to be about three thousand feet high. Captain Long named the country Wrangell's Land, after a Russian explorer. The western point of the coast in latitude 70° 46′ N., longitude 78° 30′ E., he named Cape Thomas, after the seaman who discovered it. The south-east point he called Cape Hawaii. The *Nile* sailed several

days along the coast, and approached within fifteen miles of the shore. The lower part of the land was free from snow, and appeared to be covered with vegetation. It was impossible to tell how far the land extended northwards. Ranges of mountains could be seen until they were lost in the distance.

AMONG the collisions at sea that have occurred lately and which we suppose are to defy all efforts to prevent is the following, resulting in the foundering of the two vessels. Happily the event occurred in the English Channel, so that the boats had but a comparatively short distance to make good for the land.

Early on the morning of Thursday, the 19th December, 1867, a dreadful collision happened in the Channel, a few miles off Hastings, between the homeward bound ship *Startled Fawn*, commanded by Captain King, 109 days from Calcutta, and the ship *Rushing Waters*, from Sunderland for Madras, and so terrible was the force with which they met that both of them immediately foundered, the crews having barely time to take to the boats. All were happily saved, and landed in the course of the day at Hastings. The *Startled Fawn* was an iron built ship, 763 tons, and was classed for eighteen years. She was laden with a most valuable cargo. The *Rushing Waters* was a timber built ship, 422 tons register, belonging to Messrs. Newman and Co., of London. She was from Sunderland, laden with iron and machinery for the East India Railway Company. Both ships and cargo were insured.

BUT a paper of a day or two ago gives an account which might have resulted in just such another case. Happily such cases are not of common occurrence but it is a sad derogation of the good character of our merchant ships that such things should occur.

Whitburn, near Sunderland, Dec. 22.—Signals of distress were shown early yesterday morning from a vessel on shore off this place (reports Captain Duff, R.N., of Her Majesty's ship Durham). The lifeboat, *Thomas Wilson*, belonging to the National Lifeboat Institution, was launched, but on arriving close to the wreck it was found that the long boat had been hoisted out, and receiving no answer to repeated hailing, and the sea being too heavy to risk the boat's going alongside, except to save life, her crew pulled out to sea to look for the ship's boat, and not finding her they returned to the shore. The lifeboat tried to get the vessel off, but could not succeed in doing so. Subsequently a messenger arrived from Sunderland to say that the crew of the *John* of Hartlepool had arrived there in their boat, having left the master on board the stranded ship intoxicated. The lifeboat again went off to this vessel and rescued the captain, who was found drunk and asleep in his cabin, with the water washing all round him. The brig is likely to break up.

RUTHVEN'S hydraulic propeller, of which we gave an account in the *Nautical* (vol. 1866), could not but attract the attention of the

American Admiral Farragut when he was with us, and the following appears as an extract from his report on the performance of Her Majesty's ironclad *Water Witch*, 700 tons, 160 horse-power. The vessel referred to is driven by what is called the Ruthven hydraulic propeller, which is claimed to be far superior to anything hitherto used. A company has been organised in this city to bring out this invention:—Extract from a letter from Admiral Farragut to the United States Navy Department, dated October 21st, 1867:—"From the *Excellent* we went on board the *Water Witch*. This vessel is an ironclad of about 700 tons, carries two 8-inch rifled guns, and is propelled in a most novel manner. The water rises from below into the box, whence the rotatory pump, worked by steam, throws it with great violence into two square boxes placed on the outside of the vessel, one in each side nearly amidships, and about the water line. These boxes are square tubes, ten or twelve feet long and twelve inches in diameter, open at both ends. Near the centre is a valve, under the control of the officer of the deck, and as he turns it the water is thrown with great force, either forward or aft, thus propelling the vessel ahead or astern at his will. So soon as we got on board we proceeded out of the harbour, and, to my amazement, she went ahead at a speed of seven or eight miles per hour, against a fresh breeze and quite a sea. The machinery, when once put in motion, had no interruption until we were alongside the wharf again. The movements of the vessel are entirely controlled by the officer of the deck, who, by manœuvring the valves above spoken of, can go ahead, back astern, or turn the vessel upon her centre, all of which was done with great ease, and whilst I was on board. On her return from Spithead to the wharf she made quite as much as nine knots per hour up to within fifty or sixty yards of the wharf, when she was suddenly checked and brought to the wharf with infinitely more ease than any steamer I ever saw, notwithstanding she is a heavy vessel, plated with 4½ inches of iron." It will be observed that the *Water Witch* has neither paddles, screw, nor rudder, all those offices being performed by the hydraulic motors, under the easy control of the officer of the deck.

On the subject of Telegraphic Weather Information, the following communication has been forwarded for publication by the daily prints.

"Board of Trade, Nov. 30, 1867.

"Sir,—I am directed by the Board of Trade to acquaint you, that they have been informed by the Meteorological Committee appointed by the Royal Society, that that Committee are now prepared to issue, free of cost, to ports or fishing stations which are accessible by telegraph, notice of serious atmospherical disturbance on the coasts or in the vicinity of the British Islands.

"The conditions on which these notices will be issued are as follows, viz.:—They will be forwarded in each case as soon as information of the atmospherical disturbance shall have been received at the Meteorological Office, and the ports or fishing stations to which they

are to be sent will be determined by the Board of Trade. When the list of places to which notices may be sent has been determined by the Board of Trade, it will rest with the Meteorological Committee, in each case of atmospheric disturbance, to send notices to all or any of those places as the circumstances of the particular case may appear to the Meteorological Office to be advisable.

"When a telegraphic notice of atmospherical disturbance is received at one of the places named on the Board of Trade list, its receipt is to be made public by hoisting one of the late Admiral Fitzroy's drums, and the drum is to remain hoisted for thirty-six hours after the receipt of the telegraph message containing the notice. One telegraphic notice implies that the drum is to remain hoisted for thirty-six hours, and no longer. Should the Meteorological Committee think it necessary that a drum should remain hoisted for more than thirty-six hours in any case, they will send messages to that effect, and continue them from day to day so long as it appears desirable, or until the storm shall have abated.

"If the authorities at any port or fishing station wish to receive intelligence of atmospherical disturbances, and will undertake to hoist the drum, subject to the conditions named, and subject to such regulations or directions as may from time to time be issued by the Meteorological Office, an application should be addressed to the Secretary to the Meteorological Committee, 2, Parliament Street, Westminster, S.W., in order that the necessary steps may be taken to place the name of the station on the Board of Trade list, and to provide the flagstaff and drum.

"It is to be understood that where the place or station can pay for a flagstaff and drum they will be expected to do so, if a staff and drum are not already provided; and that where it is made to appear to the Board of Trade that no staff and drum are provided, and that the place is too poor to bear the expense, then the cost will be defrayed by the Meteorological Office, with the sanction of the Board of Trade. But in all cases, whether the first cost of the flagstaff and drum are or are not borne by the local authorities, the local authorities must undertake to bear all subsequent charges connected with the hoisting of the signal, and the maintenance of the signal apparatus. The only subsequent expense that will be defrayed by the Meteorological Office will be the charge for transmission of the notices of atmospherical disturbances.

"I am sir, your obedient servant,
"T. H. Farrer."

By the following extract from an American paper we may see the methodical routine by which their small vessels of war are now armed with monster guns. Frazer's life rafts we do not know, but the *Nonpareil* lifeboats, the model of which was in our Crystal Palace last Summer, and of which she appears to have two, every one knows. Verily these modern introductions into naval warfare are going their whole lengths; first the monstrous annihilating artillery, then the well

fitted raft, as an ultimate refuge for the crowning equipments of that fighting small craft of modern times.

The Steamer *Stonewall.*—The New York *Tribune*, of August 30th, says: The *Stonewall*, or *Japan*, as it is sometimes called, is now ready to sail. The officers and crew are all on board. Capt. George Brown, her commander, with his executive officer, First Lieut. Theo. B. Dubois, were on board to-day and received Admiral Bradford, Commandant of the Navy Yard, and several other distinguished navy officers. The families and lady friends of the officers visited the steamer also. The stores for the trip were to-day being placed aboard. A sufficient quantity of coal to run the steamer to Norfolk has been placed on board, and at Norfolk the full supply of coal for the trip will be taken. The two immense lifeboats, built like the model of the *Nonpareil* that so successfully crossed the ocean, are now on the steamer. There are also two of Frazer's patent life rafts on board. Each of these will carry twelve persons comfortably. The 300-pounder and the 270-pounder Armstrong guns are in their proper places, while the engines, boilers, masts, rigging, sails, etc., have all passed inspection. Lieut. Dubois, the executive officer of the steamer, reports that the vessel is as sound as a gold dollar and does not leak one drop. Next Thursday she will sail for Norfolk, and there a day or two will be expended in hauling her upon the dry dock, examining her hull and coaling her. She will then sail for Japan, by way of the Straits of Magellan.

We shall here conclude our Novelty papers with the following announcement which concerns our Merchant seamen:

The New Merchant Shipping Act.—On January 1st, the act passed in the late session to amend the law on Merchant Shipping, 1854, came into force, and with respect to ships absent takes effect on their return to the United Kingdom. Rules and regulations are to be made by the Board of Trade as to medical stores and the supply of lemon or lime juice, and for selling medicines of a bad quality a penalty of £20 may be imposed. Whenever a seaman or apprentice is ill through the neglect of a master or owner in the supply of food, accommodation, medicine, etc., wages are to be paid by such master or owner; but where a seaman is incapable of performing his duty through his own wilful act or default the wages are to be forfeited. On board British ships a seaman or apprentice is to have a space appropriated for his use on deck of not less than 72 cubic feet and 12 superficial feet. Medical inspectors are to be appointed at ports and other places. Offences committed by British subjects are to be dealt with by courts having the ordinary jurisdiction. The harbour master at Holyhead may be appointed a justice of the peace within the limits of the place and to exercise the jurisdiction of a stipendiary magistrate. He may be appointed, though not qualified by estate, to be a justice of the peace.

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 25.)

Name.	Place.	Position.	F. or Fl.	Ht. in Ft.	Dist seen Mls	Remarks, Bearings are by Compass.
91. Spithead	Buoys and	Light	...	...	...	See Note (*a*).
1868.						
1. Garvel Point	Scotland W. C.	R. Clyde	F.	25	7	Est. 23rd December. A *Red* Light. Note (*b*).
2. Red Sea Shoal	... ...	... ...	...	...	...	See Note (*c*).

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

(a) With reference to the Notices to Mariners, Nos. 1 and 35, dated respectively 1st January and the 31st May, 1867, Notice is given, that from the 6th day of January, 1868, the red light on the pile pier, erected on the Sandhead, midway between Ryde and No-mans-land, will be discontinued.

And also, that from the same date, the *chequered red and white* buoy, formerly in position 18 yards from the pier, will be replaced.

(b) The Lighthouse stands near the South edge of the channel, at the bend, off Garvel point, and bears from the light on the Steamboat quay in front of the Custom house at Greenock S.E. by E. ½ E., and from Garvel house N.N.E. ½ E., distant 280 yards.

Bearings Magnetic. Variation 25° *Westerly in* 1868.

(c) The Master of the Steamship *Great Victoria*, has reported that on two different voyages in the Red Sea he has seen a shoal, not hitherto marked in the Charts, about 3 miles E. by N. from Gurb Miune island, and with that island in a line with Miune island (2 miles to the westward).

On the second occasion of Mr. Enright sighting the shoal, the sea broke heavily over it, and a strong wind prevented close examination.

By the bearing and distance from Gurb Miune island above given, the shoal would be in lat. 18° 32′ N., long. 38° 53′ East of Greenwich.

It will be observed that this reported shoal is in close proximity to a group of low sandy islands and shoals bordering the western coast of the Red Sea, and a considerable distance from the fairway track up and down the sea. Mariners are cautioned accordingly.

All Bearings are Magnetic. Variation 4° 20′ *Westerly in* 1868.

THE ROYAL NAVY IN COMMISSION.

Name of Vessel.	No. of Guns.	Horse Power.	Commander's Name.	Station.
Aboukir	86	400	Com. M. E. Smithett	
			Commodore Sir F. L. M'Clintock, K.C.B. ...	Jamaica
Achilles	26	1250	Capt. E. W. Vansittart...	Channel Squadron
Adventure ...	2	400	Capt. H. D. Hickley.....	China
Alert.....	17	100	Com. H. H. Knocker ...	Pacific (ord. home)
Algerine	1	80	Lieut. C. E. Domville ...	China
Antelope	3	260	„ J. Buchanan	W. Coast of Africa
Arethusa	35	500	Capt. R. Coote	Mediterranean
Argus	6	300	Com. F. W. Hallowes ...	East Indies
Asia	...	...	Capt. W. C. Chamberlain	
			Flag of Rear-Admiral Wellesley, C.B.	Portsmouth
Assurance.....	4	200	Com. J. B. Scott	W. Coast of Africa
Barracouta ...	6	300	Com. G. D. Bevan	N. Amer. & W. Ind.
Basilisk.....	6	400	Capt. W. N. Hewitt, V.C.	China
Bellerophon...	14	1000	„ R. J. J. G. Mac-Donald	Channel Squadron
Boscawen.....	20	...	Com. H. Fairfax	Portland
Brilliant	16	...	„ T. T. Bullock	Dundee
Brisk.....	16	250	Capt. C. W. Hope.....	Australia
Bristol	31	600	„ L. E. H. Somerset	
			Commodore G. T. P. Hornby	W. Coast of Africa (ord. home)
Britannia	8	...	Capt. J. Corbett	Dartmouth
Buzzard.....	6	300	Stff. Cm. J. G. H. Thain	Particnlar Service
Cadmus	21	400	Capt. A. C. Gordon	N. Amer. & W. Ind.
Caledonia.....	31	1000	„ A. H. Gardner. Flag of Vice-Admiral Lord C. Paget, C.B.	Mediterranean
Cambridge ...	...	...	Capt. the Hon. F. A. C. Foley	Devonport
Cameleon	17	200	Com. W. H. Annesley ...	Pacific
Canopus	8	...	Capt. G. J. Napier	Devonport
Caradoc.....	2	350	Lieut.-Com. J. M. D. Elphinstone	Mediterranean
Castor	22	...	Com. C. G. Nelson	Shields
Challenger ...	18	400	Com. C. J. Brownrigg	
			Commodore R. Lambert, C.B.	Australia
Chanticleer ...	17	200	Com. W. W. S. Bridges...	Pacific
Charybdis ...	17	400	Capt. A. Mc. L. Lyons...	Australia
Clio	22	400	„ N. E. B. Turnour...	Pacific (ord. home)
Columbine ...	4	150	Com. J. E. Erskine	Pacific (ord. home)
Constance ...	35	500	Capt. H. T. Burgovne, V.C.	N. Amer. & W. Ind.
Cordelia	11	150	Com. C. Parry	N. Amer. & W. Ind.

Name of Vessel.	No. of Guns.	Horse Power.	Commander's Name.	Station.
Cormorant ...	4	200	Com. G. D. Broad.....	China
Cruiser	5	60	„ M. Singer.....	Mediterranean
Cumberland...	24	...	Capt. the Hon. A. A. Cochrane, C.B.	Sheerness
Danäe	6	350	Capt. Sir M. MacGregor, Bart.	Portsmouth
Daphne.....	4	300	Com. G. L. Sulivan	East Indies
Dart	5	80	„ M. Lowther	W. Coast of Africa
Dædalus	16	...	„ I. T. M. Nicholl ...	Bristol
Dasher	2	100	„ J. H. Bushnell.....	Channel Islands
Dauntless.....	31	580	Capt. E. P. B. Von Donop	The Humber
Donegal	81	800	„ E. W. Turnour ...	Liverpool
Doris	24	800	„ C. Vesey	N. Amer. & W. Ind.
Dromedary ...	2	100	Staff-Com. J. H. Allard	W. Coast of Africa
Dryad	4	300	Com. T. H. B. Fellowes...	East Indies
Duke of Wellington ...	49	700	Capt. G. Hancock	Portsmouth
Duncan.....	81	800	„ C. Fellowes	North Britain
Durham (late Active)	...	...	Com. G. G. Duff	Sunderland
Eagle	16	...	Com. E. C. Symonds.....	Liverpool
Egmont	4	...	Capt. H. F. W. Ingram...	Rio de Janeiro
Endymion ...	21	500	„ C. Wake	Mediterranean
Enterprise ...	4	160	Com. G. S. Bosanquet ...	Mediterranean
Espoir	5	80	.....	Sheerness
Excellent	...	...	Capt. A. W. A. Hood ...	Portsmouth
Falcon	17	100	Com. H. L. Perceval.....	Australia (ord. hm.)
Favourite	10	400	Capt. J. D. McCrea	N. Amer. & W. Ind.
Fawn	17	100	Com. C. A. J. Heysham...	N. Amer. & W. Ind.
Fisgard.....	42	...	Capt. W. Edmonstone, C.B.....	Woolwich
Flora.....	40	...	„ A. Wilmhurst	Ascension
Formidable ...	26	...	„ D. Mc L McKenzie Flag of Vice-Adml. Sir B. W. Walker, K.C.B.	Sheerness
Fox	2	200	Staff-Com. W. S. Luke...	Particular Service
Frederick William.....	74	500	Capt. J. J. Kennedy, C.B.	The Shannon
Galatea	26	800	„ H.R.H. the Duke of Edinburgh, K.G. ...	Particular Service
Gannet	3	150	Com. W. Chimmo	N. Amer. & W. Ind.
Ganges	20	...	„ J. E. M. Wilson ...	Falmouth
Gladiator	6	430	Capt. E. D'O. D'A. Aplin	Particular Service
Greyhound ...	5	200	„ C. Stirling	S. E. Coast of Am.
Helicon	...	250	Com. C. G. Lindsay	Channel Squadron
Hibernia	104	...	Com. G. L. Norcock. Flag of Rear-Admiral H. Kellett, C.B.	Malta
Highflyer	21	250	Capt. T. M. S. Pasley ...	East Indies
Himalaya.....	2	700	„ S. B Piers	Particular Service
Hydra	1	220	„ P. F. Shortland ...	East Indies

Name of Vessel.	No. of Guns.	Horse Power.	Commander's Name.	Station.
Icarus	3	150	Com. S. P. Townsend ...	China
Implacable ...	24	...	„ P. W. Pellew	Devonport
Impregnable..	78	...	Capt. F. S. Tremlett.....	Devonport
Indus	...	...	„ G. O. Willes, C.B. Flag of Rr.-Adml. the Hon. J. R. Drummond, C.B.....	Devonport
Industry	...	80	Staff-Com. C. T. Youel...	Particular Service
Investigator...	2	34	Lieut.-Com. A. E. Kay...	W. Coast of Africa
Irresistible ...	60	400	Capt. L. G. Bowyear ...	Southampton
Jackal	1	150	Lieut. A. E. Dupuis	W. Coast of Scotland
Jaseur	5	80	Com. C. F. Hotham	W. Coast of Africa
Jason	17	400	Capt. C. M. Aynesley ...	N. Amer. & W. Ind.
Landrail	5	80	.....	W. Coast of Africa (ord. home)
Lee	5	80	Com. C. W. Andrew.....	W. Coast of Africa
Leven	2	80	Lieut. Cm. O. S. Cameron	China
Liffey	31	600	Capt. J. O. Johnson	Particular Service
Lion	60	400	Capt. J. M. Hayes, C.B.	Greenock
Lizard	1	150	Lieut. S. G. Price	Sheerness
Lord Clyde ...	23	1000	Capt. R. Dew, C.B.	Mediterranean
Lord Warden	20	1000	Capt. W. R. Rolland ...	Ditto
Lyra	7	60	.....	East Indies
Malacca	13	200	Capt. R. B. Oldfield	Pacific
Manilla	...	70	Nav.-Lieut. J. R. Ryan	China
Medusa.....	...	312	Staff-Com. T. Potter ...	Particular Service
Mersey	36	1000	Capt. R. D. White, Flag of Rear-Admiral C. M. H. Buckle, C.B....	Queenstown
Minotaur	34	1350	Capt. J. G. Goodenough. Flag of Rear-Admiral F. Warden, C.B.	Channel Squadron
Mutine	17	200	Com. H. M. C. Alexander	Pacific
Mullet	5	80	„ E. Kelly	N. Amer. & W. Ind
Myrmidon.....	4	200	Com. H. B. Johnstone...	W. Coast of Africa
Nankin	50	...	Capt. R. Hall	Pembroke
Narcissus	35	400	„ J. C. Wilson. Flag of Rear-Admiral G. Ramsay, C.B.....	S.E. Coast America
Nassau	5	150	Capt. R. C. Mayne	Straits of Magellan
Nelson	72	500	Com. C. B. Payne.....	Melbourne
Nereus	6	...	Master J. P. Dillon	Valparaiso
Niger	13	350	Capt. J. M. Bruce.....	N. Amer. & W. Ind.
Nimble	5	80	Com. A. J. Chatfield.....	N. Amer. & W. Ind.
Niobe	4	300	„ T. K. Mackenzie...	N. Amer. & W. Ind.
Nymphe	4	300	„ T. Barnardiston ...	East Indies
Oberon	3	260	Lieut.-Com. J. Shortt ...	S. E. Coast America
Ocean	24	1000	Capt. C. S. S. Stanhope	China
Octavia...	35	500	Com. M. G. Jackson, brd. pend. of Commodore L. G. Heath, C.B. ...	East Indies

Name of Vessel.	No. of Guns.	Horse Power.	Commander's Name.	Station.
Orontes	2	500	Capt. H. Phelps	Particular Service
Pallas	6	600	Capt. E. H. G. Lambert	Channel Squadron
Pearl	21	400	„ J. F. Ross	China
Pelorus	21	400	„ W. H. Haswell ...	China (ord. home)
Pembroke ...	25	200	Capt. Hon. J. W. S. Spencer, b. p. Commo. J. W. Tarleton, C.B ...	Harwich
Penguin	5	80	Lieut.-Com. J. J. Martin	East Indies
Perseus	15	200	Com. C. E. Stevens	China
Peterel	3	150	„ W. E. Gordon	Cape of Good Hope
Phœbe	35	500	Capt. T. Bythesea, V.C.	N. Amer. & W. Ind.
Plover	3	160	Com. J. A. Poland	W. Coast of Africa
President	16	...	Com. H. W. Comber.....	City Canal
Prince Consort	31	1000	Capt. E. A. Inglefield ...	Devonport
Princess Charlotte.....	12	...	„ O. J. Jones	Hong-Kong
Pylades	17	350	„ C. W. Buckley, V.C.	Sheerness
Racer	11	150	Com. L. Brine	Mediterranean
Racoon	22	400	Capt. R. Purvis.....	Cape of Good Hope
Ranger	5	80	Com. W. A. Cambier ...	W. Coast of Africa (ord. home)
Rattler	17	200	„ J. T. Swann	China
Rattlesnake ...	19	400	Capt. W. M. Dowell, C.B.	Devondort
Reindeer	7	200	Com. E. Nares	Pacific
Research	4	200	„ A. Morrell	Particular Service
Revenge	73	800	Capt. W. J. S. Pullen ...	Pembroke Dock
Rifleman	5	100	Mas.-Com. J. W. Reed...	China Seas
Rinaldo	7	200	Com. W. K. Bush	China
Rodney	78	500	Capt. A. C. F. Heneage. Flag of Vice-Admiral Sir H. Keppel, K.C.B.	China
Rosario	11	150	Com. G. Palmer	Australia
Royal Adelaide	26	...	Capt. W. G. Preedy, C.B. Flag of Admiral Sir W. F. Martin, Bt., K.C.B.	Devonport
Royal Alfred ..	18	800	Capt. The Hon. W. C. Flag of Vice-Adm. Sir G. R. Mundy, K.C....	N. Amer. & W. Ind.
Royal George	72	400	Capt. T. Miller	Kingstown
Royal Oak ...	35	800	„ H. S. Hilyar, C.B.	Portsmouth
St. George ...	72	500	„ M. S. Nolloth	Portland
St. Vincent ...	26	...	Com. R. Carter	Portsmouth
Salamander ...	6	220	„ G. S. Nares	Sheerness
Salamis	...	250	„ F. G. Suttie	China
Satellite	17	400	Capt. J. Edye	East Indies
Scout	21	400	„ J. A. P. Price	Pacific
Sealark	8	...	Lieut. J. N. Croke	Devonport
Seringapatam	...	...	Commo. G. G. Randolph	Cape of Good Hope
Serpent	4	200	Com. C. J. Bullock	China
Sharpshooter..	6	160	Lieut. B. S. Hamilton ...	S.E. Coast America
Shearwater ...	4	150	Com. T. E. Smith	Pacific (ord. home)

Name of Vessel.	No. of Guns.	Horse Power.	Commander's Name.	Station.
Simoon	4	400	Capt. T. B. Lethbridge...	Particular Service
Slaney	1	80	Lieut. W. F. L. Elwyn...	China
Sparrow-hawk	4	200	Com. E. A. Porcher	Pacific
Speedwell.....	5	428	Com. J. P. J. Parry	W. Coast of Africa
Sphinx	6	500	Capt. R. V. Hamilton ...	N. Amer. & W. Ind.
Spiteful	6	280	Com. B. L. Lefroy	East Indies
Star	4	200	„ R. Bradshaw	East Indies
Supply	2	80	Staff.-Com. C. Bawden...	Particular Service
Sylvia	5	150	Com. E. W. Brooker.....	China Seas
Tamar	2	500	Capt. F. W. Sullivan, C.B.	Particular Service
Terrible	19	800	„ J. E. Commerell, V.C., C.B.	Mediter. (ord. home)
Terror	16	200	„ J. F. B. Wainwright	Bermuda
Topaze	31	600	Com. R. A. Powell, C.B.	Pacific
Trafalgar	60	500	Capt. E. K. Barnard.....	Lough Swilly
Trincomalee...	16	...	Com. E. T. Nott	Hartlepool
Urgent	4	400	Capt. S. H. Henderson...	Particular Service
Vestal	4	300	Com. S. P. Brett	W. Coast of Africa
Victory.....	12	...	Capt. F. P. B. Seymour. Flag of Vice-Admiral Sir T. Pasley, Bart. ...	Portsmouth
Vigilant	4	200	Com. R. A. O. Brown ...	East Indies
Viper	2	166	„ H. E. Crozier	Particular Service
Virago	6	220	„ H. M. Bingham ...	Australia
Warrior.....	32	1250	Capt. H. Boys	Channel Squadron
Wasp.....	13	100	„ N. B. Bedingfield...	East Indies (od. hm.)
Waterwitch ...	...	167	Com. P. R. Sharpe	Particular Service
Wellesley.....	72	...	„ W. H. Stewart, C.B.	Chatham
Winchester ...	12	...	Com. G. M. Balfour.....	Aberdeen
Wolverine.....	21	400	Capt. T. Cochrane	N. Amer. & W. Ind.
Wyvern	4	350	„ G. A. C. Brooker..	Particular Service
Zealous	20	800	„ R. Dawkins. Flag of Rear-Admiral Hon. G. F. Hastings, C.B...	Pacific
Zebra	7	200	Com. E. J. Pollard	China

The foregoing list does not include all the Store Ships, Despatch, and Surveying Vessels.

THE Navy List contains no very important alterations, as compared with that of the past quarter. Seven vessels, carrying 107 guns, have been commissioned, viz. :—

The *Buzzard*, 6, 300, Staff-Commander J. G. H. Thain, Particular Service.

The *Danäe*, 6, 350, Captain Sir M. MacGregor, Bart., Portsmouth.

The *Myrmidon*, 4, 200, Commander H. B. Johnstone, West Coast of Africa.

The *Plover*, 3, 160, Commander J. A. Poland, West Coast of Africa.

The *Pylades*, 17, 350, Captain C. W. Buckley, V.C., Sheerness.

The *Rosario*, 11, 150, Commander G. Palmer, Australia.

The *Trafalgar*, 60, 500, Captain E. K. Barnard, Lough Swilly.

Five vessels have been paid off, of which the following is a list:—

The *Aurora*, 35, 400, Captain A. F. R. De Horsey, from North America and the West Indies.

The *Esk*, 21, 250, Captain J. P. Luce, from Australia.

The *Megæra*, 4, 350, Captain J. Simpson, Particular Service.

The *Torch*, 5, 80, Commander G. A. Douglas, from the West Coast of Africa.

The *Triton*, 3, 260, Lieut. R. H. Napier, from the South-east Coast of America.

Fourteen vessels are now under orders for home, viz.:—

The *Alert*, 17, 100, Commander H. H. Knocker, from the Pacific.

The *Assurance*, 4, 200, Commander J. B. Scott, from the West Coast of Africa.

The *Bristol*, 31, 600, Captain L. E. H. Somerset, bearing broad pendant of Commodore G. T. P. Hornby, from the West Coast of Africa.

The *Clio*, 22, 400, Captain N. E. B. Turnour, from the Pacific.

The *Columbine*, 4, 150, Commander J. E. Erskine, from the Pacific.

The *Falcon*, 17, 100, Commander H. L. Perceval, from Australia.

The *Landrail*, 5, 80, from the West Coast of Africa.

The *Lyra*, 7, 60, from the East Indies.

The *Pelorus*, 21, 400, Captain W. Haswell, from China.

The *Ranger*, 5, 80, Commander W. A. Cambier, from the West Coast of Africa.

The *Shearwater*, 4, 150, Commander T. E. Smith, from the Pacific.

The *Terrible*, 19, 800, Captain J. E. Commerell, V.C., C.B., from the Mediterranean.

The *Wasp*, 13, 100, Captain N. B. Bedingfield, from the East Indies.

The *Wolverine*, 21, 400, Captain T. Cochrane, from North America and the West Indies.

The following officers' names have been removed from the official lists of the Royal Navy during the past quarter:—

Chaplain Rev. Alfred Earle, M.A., late of the *Favourite*, 10, on the North America and West India station (resigned); Paymaster John Mallard, late of the *Castor*, 22, drill ship for the Royal Navy Reserve, at North Shields (dismissed by court-martial); Acting Navigating Sub-Lieutenant George G. M'Ewen, late of the *Arethusa*, 35, in the Mediterranean (dismissed the service for misconduct); Acting Sub-Lieutenant David Brown, late of the *Leopard*, 18, at China (resigned); Assistant-Surgeon James F. Fitzgerald, late of the *Mullet*, 5, on the West Coast of Africa (resigned); John Middleton, M.D., late of Greenwich Hospital (resigned); William Jones, late of the *Fawn*, 17, on the North American station (resigned); and Conrad C. Wimberley, M.D., late of the *Princess Charlotte*, at Hong-Kong (resigned).—*Hants. Telegraph.*

CAPTAIN WARREN'S SYSTEM OF COOKING.

A PRACTICAL demonstration of Captain Warren's system of cooking for the army and other large bodies of men has been given at the house of the Society of Arts, John Street, Adelphi, in the presence of a tolerably large number of the members and their friends, including a

fair proportion of ladies. Captain Warren's apparatus consists of two parts, the stove proper, and the hot air and steaming vessels in connection with it. The stove, which is of wrought iron, contains two boilers, for supplying water for breakfasts, teas, and washing-up purposes, and for furnishing steam to the cooking vessels; and a roaster, or oven. From the peculiar construction of the two boilers, which by their shape from the flues, the heat is communicated to them in the most economical manner; and it is with the steam thus formed that the principal portion of the work is done, by making it pass through the inner and outer linings of the rectangular cooking-tins on the top. These tins simply rest on the stove, and can be put on or off at pleasure. The stove is of wrought iron, containing no brick in its construction. The fire, after passing between the boilers, heats the oven, or roaster, behind and above which lies a portion of the upper boiler. The boilers are supplied from behind, the filling pipes forming also vents, and being furnished with whistles to give warning of a deficiency of water. The advantages claimed for this apparatus are that the meat is cooked in its own juices, preventing absorption of water or loss; that burning, smoking, or over-boiling from too high a temperature is avoided; with a consumption of four ounces to seven ounces of fuel per man a day; and great simplicity of construction, so that the merest tyro can use it.

At Aldershot the apparatus has been in use for some time, and practical experience has shown that the daily rations of 200 men may be cooked with an expenditure of only thirty-five pounds of coal. Nor is the saving of fuel the only economy. All meat diminishes in weight in the process of cooking; but in the case of meat cooked according to Captain Warren's system this necessary loss is diminished by about two ounces in every pound. Two courses were cooked under the direction of Captain Warren, and were then tasted by the visitors. The first course consisted of three fowls, and the second of three legs of mutton, and each dish was cooked in a different manner. One fowl and one leg of mutton were simply boiled in the ordinary manner; another fowl and another leg of mutton were what is called "Warrenized"—that is, were dressed in one of the cooking tins by hot air only, without coming in contact with either steam or water; while the third fowl and leg of mutton, after being cooked in this manner, were browned by being placed for a short time in the oven. There could be no question as to the success of the experiment—or rather, for it was no experiment, of the demonstration. The Warrenized joints had lost less weight than those which were boiled, and at the same time retained more of the natural juices of the meat, and were richer and better flavoured, while those which had been browned in the oven were very similar in character, and little, if at all, inferior in flavour to joints roasted before the fire. With the meat were served some potatoes which had been cooked in a vessel specially prepared for the purpose, and the "mealiness" of which, as they were placed upon the table with their white bodies bursting through their "jackets" in half a dozen places at once, left nothing to be desired.

Although Captain Warren's apparatus is specially intended for the

use of the army and navy, and of hospitals, prisons, workhouses, and other large establishments, it is applicable to the necessities of private families, and if adopted for ordinary domestic cooking would produce a material saving both of fuel and meat. Before Captain Warren's joints were ready, what is called the Norwegian cooking apparatus was shown in operation in another room. According to this system the meats to be cooked are placed in closely covered saucepans, and exposed for a few minutes to a high temperature. When the pans are removed from the fire they are placed in a box lined with a thick felt padding, and the process of cooking is completed by the action of the heat which they have already acquired, and which is retained by the felt lining. Several dishes—roast and boiled fowl, boiled leg of mutton, and Irish stew—were thus produced, and were highly approved of by many of the visitors. There was, however, some little uncertainty as to their character; and although this system may be usefully employed for the cooking of victuals which have to be transported some distance before they are eaten, it is hardly likely to be generally adopted under other circumstances.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, *in January*, 1868.—*Sold by J. D. Potter*, 31, *Poultry, and* 11, *King Street, Tower Hill, London.*

225. $\frac{DE}{2}$m = 3·0 Labrador Coast, Indian Tickle and Occasional Harbours with view. Commander Chimmo, R.N. 1867. 1s.

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223. $\frac{DE}{2}$m = 3·0 Labrador Coast, Webeck and Hopedale Harbours with view and Allik Bay. Commander Chimno, R.N. 1867. 1s.

2293. $\frac{DE}{2}$m = *various.* California Gulf, S. Lorenzo Channel and reef, Esterro de Agiabampo, La Paz, and Culliacan River. *Vaious authorities.* 1866. 1s.

2511. DEm = 0·25 Russian Tartary, Strelok Bay to St. Vladimir with five plans. *Various authorities.* 1867. 2s. 6d.

EDWARD DUNSTERVILLE, *Commander, R.N.*
Hydrographic Office, Admiralty, 20th January, 1868.

TO OUR FRIENDS AND CORRESPONDENTS.

DEEP SOUNDING MACHINE.—We have received the paper from the Russian Imperial Bulletin. It would expedite our correspondent's views to send us *his* description translated into English.

JURY RUDDER.—Our old friend Captain Heckford's Jury Rudder—reserved for our next.

JAVA SOURABAYA.—The letter of Mr. D. Boeke has duly reached us, and shall have early insertion.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

MARCH, 1868.

NOTES FROM A JOURNAL.

The Hurricane Theory,—Tortola and its late Earthquake,—Marine Barometers,—Isle St. Thomas, and its fire brigade,—The Emancipated Negro,—The Report on Isle St. Thomas by Vice-Admiral Porter,—Account of the late Earthquake by Mr. Otto Frederick Raupach.

LEFT Halifax in December bound south. The barometer had been unusually low for several days prior to our departure, and those who pass for being wise in weather warning, predicted a stormy, troublesome passage. Observation proves that on the cost of Nova Scotia the mercury is subject to considerable depression without a gale following; especially if snow is about to fall, and that rain and wind often come many hours before warning is given by the barometer.

The wind was fresh from west-north-west, and the sea being smooth ten knots an hour were made good, without carrying a heavy press of sail on the ship. To give a clearer idea of the cyclone which we encountered, it may be stated that on passing Sambro the barometer at noon was 29·40, air 32°. At midnight, having run one hundred and ten miles S.S.W., the barometer rose to 29·72, air 25°. At six a.m. of the following morning the wind fell light and veered by the north, and east to E.S.E. with gloomy cold weather, for the thermometer showed 28°. At ten the wind veered to E.N.E., force five, and the snow fell in thick flakes, air 31°, barometer 29·64. By noon the force of the wind had increased to six or seven, the snow had turned to rain, and the steady falling of the barometer indicated that bad weather was at hand. In order to make the behaviour of the barometer description

more clear, the readings of it and those of the thermometer for the succeeding seventeen hours are here arranged:—

Lat. 40°·53′ N., long. 63°45′ W.—

Time.	Barom.	Ther.	Time.	Barom.	Ther.	Time.	Barom.	Ther.
Noon	29·57	35°	6 P.M.	29·34	Not reg.	Midnt.	29·74	46°
1 P.M.	29·40	40	7	29·39	47°	1 A.M.	29·85	46
2	29·35	43	8	29·46	48	2	29·87	46
3	29·30	46	9	29·56	49	3	29·92	46
4	29·20	49	10	29·62	47	4	29·93	46
5	29·28	Not reg.	11	29·68	46	5	30·02	47

The wind and weather for the same time were as follows:—

Noon	E.N.E.	Force 7		c. q. s.
P.M. 3	„	„	8— 9	c. o. r.
4	„	„	9—10	„
6	N.N.E.	„	9— 8	„
8	North	„	„	„
10	N.N.W.	„	8— 7	o. q. p.
A.M. 1	N.W.	„	7	b. c. q.
4	W.N.W	„	7— 6	b. c. q. p.

It will be seen that at six a.m. the centre was right ahead, but at eight was four points on the port bow and the ship fairly in the north-west quadrant of the storm, although closing the centre until five p.m., when the mercury had sensibly risen. During this period it was a pleasing sight to see the ship going twelve and a half knots an hour, and to feel certain that the storm would veer by the stern until it reached W.N.W., and then gradually died away. At nine p.m. the moon broke out for a few seconds from the heavy clouds and showed our close reefed topsails dragging on their heavy burden under the force of the storm, and the crested waves breaking harmlessly under the quarters.

I have never seen the theory of storms so beautifully illustrated as in this gale. Only once, about four p.m., did I feel uneasy. After that hour I felt as secure as if I had held the wind in my grasp and made it veer, to prove how correctly Reid * has pointed out the rules which govern its course.

The highest registered force of the wind is ten. But it must be borne in mind that the rate at which the ship ran before it apparently reduced the strength of the gale. Had she been hove to, eleven would probably have been recorded in the fierce squall which preceded the first rise of the barometer.

Calling at Tortola there was much to be disappointed with in its appearance. Such awful accounts had been given of the ruin everywhere said to be visible that one was surprised to see the little change which ten years had wrought in the wretched assemblage of dwellings

* It is gratifying to find a ship handled in this masterly way, owing principally to the discovery of Redfield's, published in this journal in 1836, and beautiful as this illustration is there were many others in these pages long before Reid took up the subject.

in this island. There is an anecdote related somewhere which says that the Dey of Algiers once asked Lord Exmouth how much it had cost England to lay his town in ruins? When informed of the probable amount, his highness, shrugging his shoulders, observed, "I would have done it for half the money." In like manner, if the Tortolians receive the very liberal subscriptions which are pouring in from the whole civilized world, they might welcome a hurricane any year on similar terms.

Many touching anecdotes are told of the late hurricane. One man had taken refuge in a barn, and the roof being blown off it soon afterwards, naturally looking upwards, to his dismay he saw his own house with wife and children passing rapidly overhead. My informant did not mention what had been their subsequent fate. Again it was stated that a negro was blown over Mount Charlotte when in the north-west quadrant of the storm, and blown back again quite unhurt when the north-east quarter shortly afterwards went over it. But it did not appear that a single stone building had been injured, although the miserable shanties and wooden buildings were unroofed and the furniture scattered by the winds. Nor was there a single trace of that reported submergence, even about those houses which stand close to the sea. The palm trees most attracted attention, probably from their striking resemblance to the caps worn by men as they had once appeared to me from a railway carriage in Colon. The stems were inclined slightly inland and the long gracefully formed leaves were hanging loosely down. A few of them were quite destroyed but the greater part will soon flourish again as before. It is especially within the tropics that nature is always ready in quickly repairing the havoc and damage which violence produces in her rich domain, while man toils painfully and slowly at his work. The fore topmast and topsail yard of the *Rhone* steamer are still standing, and a portion also of her upper works is yet awash with the surface. From the relative positions of the fore and after bodies of this wreck nearly at right angles to each other, it would seem that she must have broke into two parts immediately she struck, (Does this raise a question as to her build?) and the fore part would appear to have turned to its present position before it touched the bottom. Shall we ever have a satisfactory account of this melancholy wreck? It would appear that no one in either of the ships suspected the possible occurrence of a hurricane so late in the season, and in the hurry of transfer the warnings of the barometer were possibly overlooked.

It is an undoubted fact that hundreds of the barometers on board our merchant steamers are quite untrustworthy, even where the fall of a tenth of an inch may foretell a hurricane. Not even in the ships of the Royal Mail Company has ever been found to my knowledge the tested instrument, which the Brussels Conference and the late lamented Admiral FitzRoy so earnestly recommended to all seamen. It seems scarcely possible that a well tested barometer, if registered hourly, should have failed to give warning of the approach of such a storm as that of the 29th of October last.

My information about Isle St. Thomas is entirely from hearsay. The people were taken by surprise like those at Tortola, yet no precautions in such a crowded *cul de sac* as the harbour is, could have saved the shipping or town from disaster. The West Indian and Pacific Steam Ship Company had been warned before the site of their wharf was purchased, that no building could resist the shock of a hurricane in such an exposed situation. The gentleman whom they sent out to purchase it may have been a proficient at the ledger, but certainly his pursuits did not qualify him with the slightest knowledge of civil engineering as applied to nautical affairs. Their steam ship *Colombian* was probably one of the most finished specimens of naval architecture afloat, and now after less than one year's work there she lies at the bottom of the harbour a broken mass of old iron, without a hope of ever being raised.

The houses of the island appear to have suffered more from the earthquake than the hurricane, destructive as the latter undoubtedly was. Wood tenements or shingle roofs are soon replaced, but when solid walls of stone masonry are rent, it takes a long time to cover up the scars.

The future or it may now be said the present possessors of Isle Saint Thomas, will doubtless secure the harbour from such a visitation again, as far as human skill can effect it. A breakwater connecting Rupert Rock with the shore, would add greatly to the security of the anchorage.*

The particulars of the earthquake wave are so coloured that it is difficult to arrive at the truth of them. An eye-witness informed me that it swept directly over Brush Island, which is tolerably high, and advancing thence on the harbour was only prevented from visiting the town, by the check it received from the overlapping points which in somewise shelter the entrance of the port. However, it appears pretty certain that vessels which were lying in four fathoms water were left dry for a short time as the wave receded; but the subsidence must have been very gradual as none were wrecked from its effects, although at Santa Cruz an American frigate was deposited *in the market place!* where she now lies abandoned; her crew having returned to New York with the remains of their late Admiral, who died of fever.

The busy little town is fast recovering its wonted condition. That elasticity of spirit is here with which men buy and sell as of old under their temporary roofed stores, and hope for returning days of prosperity.

* Time, it is very well known, can work wonderful changes in the history of nations as well as in the feelings of their people. That hoary-headed monitor of mankind is at his old work; for while we English view with apathy this first foundation of a most formidable arsenal by the most aggressive power of the whole world, here it is to be in the midst of our once flourishing West Indian possessions, an arsenal in fact from which an American fleet could sally forth and reduce the whole of our ill-fortified West Indian garrisons, in a few weeks to ruins. The time has arrived when we must do one of two things with many of our colonies. We must either dismantle, or fortify them. As they are at present they can only inflict disgrace on our flag should a war unhappily suddenly break out! Let England look to this! Ed. *N. M.*

Ships are loading and unloading in the harbour amidst an overpowering stench proceeding from decaying cargoes, and it is to be feared decaying human bodies also. Pumping and diving apparatus were now at work raising the floating dock and wrecks, but it will be long before the last traces of these disappear.

The narrow belt to which this hurricane confined itself is the most surprising feature about it. Santa Cruz is in sight of Saint Thomas, yet its inhabitants had not even the slightest suspicion that their sister island was enveloped in darkness and storm. Vessels arriving from Europe and the African coast, report unusually strong trade winds, for these have almost disappeared of late years, and it will be a curious result should the permanent revival of these breezes be again established by the unseasonable visitation of this hurricane.

In the course of our voyage we visited Barbados, the most uninteresting of these islands in scenery and general outline. When we were running in for the anchorage there was a mosquito fleet of small fishing boats under a press of sail employed in catching flying fish. It is a common opinion among seamen, although quite wrong, that these fish are caught at night by nets stretched along the boat aided by several lanterns or torches, the fish being supposed to fly directly at the light, and so become entangled in the meshes of the net. Instead of this it was found by us that each boat was supplied with three circular nets, very similar to those used for shrimping in England, but not fitted with a purse. These are towed astern and on either quarter, and hauled in for cleaning at certain intervals. Fishing yields everywhere but a precarious existence, and Barbados is not exempted from the rule. As it is absolutely necessary in this climate to consume all the fish taken on each day, it is the great object of fishermen to arrive at a certain hour in the market with their catch. Sometimes the breeze fails and they are unable to reach it in time, or the trade wind is too light to waft their boats home with sufficient velocity to entrap these active little winged fishes.

In the course of the present year 1867, there appears to have been a great disturbance in the elements over a large portion of the West Indies, and Barbados has not been exempt. About the end of October six inches of rain fell in *four hours*. This reminds me of the difference of opinion which exists regarding the scource from whence the springs are supplied, as there is not an extensive area of high land above the elevation of the spring which supplies the city of Bridgetown in that island. The main pipe is fifteen inches in diameter, and never shows any signs of failure even in the dry season, which generally lasts nine months of the year. As it is three hundred feet above the level of the sea, the authorities, since the late disastrous fire, have established a regular net work of hydrants in every street at a distance of seventy-five feet from each other. There are three principal stations and at each a sergeant and five men are always on duty. The hoses are kept on *large reels* or wheels, and the party which in the event of a fire brings the first jet of water from the hydrant into action receives a gratuity of one pound in addition to the regular pay. These hydrants

are so powerful that a jet will drive in an ordinary door. At first white and black firemen were taken on indiscriminately, but the mixture of races proved a failure, and Sambo now reigns supreme. Stripped to the waist, with his dark skin streaming with perspiration, and covered with dust, and his large white teeth almost flashing back the lurid flames, a good portrait of the Bridgetown fireman might pass for that of the denizen of a warmer place than Barbados!

The liberation of the slaves brought its full share of prosperity to this island although its soil is actually one of the poorest in the West Indies, and requires a great deal of manure every year. Labour is very cheap, and this enables the planter to cultivate the land better than he could do elsewhere. Therefore *he* has no wish to see the revival of slavery. The physical effects of liberation are becoming more marked every year; but the race is deteriorating not only in physical strength but in length of days. This however is due to many causes, principally to debauchery and the hard lives which necessity compels the negro to lead from a very early age. In such a climate it is not uncommon to find several families living in a wretched hut by the roadside, without any separation of sexes. This produces its first natural effect in a disregard of marriage. In fact the virtuous people of Exeter Hall would lift their eyes with pious horror, did they know the correct state of things in Barbados, if not in some more of these islands. It seems to be beyond the power of the clergy to cure this crying evil, but they should cease to bring so many Uncle Toms under our notice. In the olden time the slaves on every estate were allotted work according to their health and strength;—the sick were nursed like valuable animals, as they were, and the supply of food was ample. But now so crowded is the population, thicker even than China, that actual want is not unfrequent among the poor. In harvest time or the crop season hundreds go to Demerara, and other colonies on the main land. But so great is their love of home that few remain away permanently. Not long ago about five hundred emigrated to Liberia. Those who were able to do so have returned. Nearly two hundred have died in that land of promise, and the remainder are dragging out a wretched existence in the most extreme poverty and despair. It will be long before a Barbadian again turns his face eastward.

The whole island of Barbados consists of coral, which contains many beautiful specimens of madrepores and the various species of coral. Recent examinations with the microscope prove that the soil on the summits of the highest hills is composed entirely of infusoria which could only have existed several thousand feet below the surface of the sea.

[As the foregoing interesting extracts from a West India journal include some important remarks on Isle St. Thomas, we shall take the opportunity of adding to them the official report on that island by the American Admiral, from which will be seen the light in which the island is regarded by his countrymen, and the change in character which it will very soon undergo in the hands of the American Government. The extreme unhealthiness of its harbour has been considered by good judges to arise in a great measure from the *cul de*

sac which it forms. Were an opening cut through the isthmus at this part so that the sea-water might flow *through* it, the stagnation of that of the harbour would be prevented, and a serious cause of its impurity and foul air would be removed. The well-known energy of our friends would soon effect this as a trifle in the engineering way. Ed. *N. M.*]

Vice-Admiral Porter, of the United States navy, has written the following letter, describing the value of the island of St. Thomas as a naval station :

United States Naval Academy, Annapolis, M.D.,
November 6th, 1867.

Sir,—St. Thomas, the principal of the Virgin Islands, holds the most prominent position in the West Indies as a naval and commercial station. It is situated in latitude 18° 22′ N., longitude 65° 26′ W., and lies right in the track of all vessels from Europe, Brazil, East Indies, and the Pacific Ocean, bound to the West India Islands or to the United States. It is the point where all vessels touch for supplies when needed, coming from any of the above stations. It is a central point from which any or all of the West Islands can be assailed, while it is impervious to attack from landing parties, and can be fortified to any extent. Nothing can be more beautiful than the town and bay of St. Thomas as seen from the sea, or from the great summit that overlooks them. The bay, at the head of which lies the town of St. Thomas, is almost circular, the entrance being by a neck guarded by two heavy forts which, although not capable at present of resisting the heavy ordnance now in use, can be so strengthened and protected that no foreign power could ever hope to take it. St. Thomas is a small Gibraltar of itself, and could only be attacked by a naval force. There would be no possibility of landing troops there, as the island is surrounded by reefs and breakers, and every point near which a vessel or boat could approach is a natural fortification, and only requires guns, with little labour expended on fortified works. It is true that this island was captured by the British in 1807, while under the charge of the Danish governor Van Schotten, but there was not a shot fired, or any effort made to defend the place. This is the only instance where the island has ever been in the hands of a foreign enemy, and the British would have held it to this day, instead of for seven years, could they have done so without difficulties. There is no harbour in the West Indies better fitted than St. Thomas for a naval station. Its harbour, and that of San Juan, and the harbours formed by Water Island, would contain all the vessels of the largest navy in the world, where they would be protected at all times from bad weather, and be secure against an enemy. Gregorie Channel, half a mile to the west of the harbour of St. Thomas, is, if anything, a better harbour than St. Thomas, and inaccessible to any enemy if properly fortified. No enemy's vessels can enter these harbours, for their entrances are so narrow that they can be completely obstructed by heavy chains against which no ship would venture to run, with a number of 15-inch guns firing on her.

The harbour of St. John, eight miles to the east of St. Thomas, is a still better harbour than St. Thomas, and has some advantages not possessed by the latter. It is capable of being thoroughly defended with cannon and chain, and in all these harbours forts of single guns can be built up from height to height in such a manner that the plunging shot would destroy any vessel rash enough to approach within range.

If it ever should be intended to make a great naval depot in the West Indies, St. Thomas offers all the advantages and facilities for making dry docks, coal stations, and arsenals, all under complete protection. Great Krum Bay is a natural dock itself, with a depth of 4½ fathoms, and an entrance 300 feet in width. It would only require filling up across the mouth, and to be pumped out, to make a fine basin for the largest sized ships. The natural resources of the island of St. Thomas are not great, unless it may be in materials yet undiscovered. Its chief value is as a naval station and a great commercial point. Its small size is in its favour, because it cannot subsist an army of any kind, and an enemy could not land anywhere without the reach of guns; the whole area of the island is only forty-five square miles, the surface rugged and elevated, and almost devoid of trees, which, having been cut down unsparingly, have laid the island open to the sun, and caused a scarcity in the supply of water. This deficiency is, however, supplied by tanks, which are kept filled at all seasons by the rains. No doubt water could be obtained by sinking artesian wells, as at San Juan there are several springs flowing out of the rocks. The distinguishing characteristics of St. Thomas are its advantages as a place of trade, a fact evinced by the great number and large extent of the merchants' stores, the immense piles of merchandise they contain, and the number of vessels of all nations which are lying in the harbour. It is the great centre for all the steam lines that run through the West Indies and to Europe, and is the stopping place of our United States line to Brazil. No stronger proof of its being a central point than this circumstance is needed. A steamer comes in daily, and in St. Thomas, more than any other place in the West Indies, can we know what is going on in the world.

Nothing can be more delightful than the society of St. Thomas. Hospitable to a fault, all strangers, particularly Americans, receive the greatest kindness and attention. These hospitalities are on a scale commensurate with the wealth and importance of the inhabitants. There are few more beautiful prospects than the splendid panoramic view from the highest point in the island, where the whole town and bay of St. Thomas is spread out like a map at your feet, and whence vessels at sea can be seen approaching at a distance of thirty miles. This is in fact the best look out in the West Indies. Nearly all vessels run for the Anegada passage in making the West Indies, and cannot pass without being seen from St. Thomas. The following named islands are in plain sight from St. Thomas in all weather. The verdant island of Santa Cruz and the large island of Porto Rico, also the innumerable small islands of the Virgin group, which make it an enchanting place

to cruise in. The trade-wind blows throughout the year over the hills and bay of St. Thomas, although it is rather hot in the town in midsummer. The summit is covered with handsome cottages, where those of the inhabitants who can afford it retire for comfort and fresh air. The tropical shrubs which abound in this island are especially beautiful, the gigantic cactus and aloe growing in the wild freedom of unchecked nature, and everything else luxuriating in the most fantastic conformations, forming a scene of much novelty and beauty to a stranger. There is no place where a stranger enjoys himself more than at St. Thomas, and if the island was the property of the United States it would become a popular resort. The inhabitants have traded with us so long that their habits assimilate with ours. They are republican in their institutions, and would not have to change their actual form of government in coming into the Union. Although in fact belonging to a monarchy, their system is republican. All the officers of the island, except the governor and one or two others, are appointed by the home government. It may be well to mention that the inhabitants are mostly coloured, but they are extremely well educated. Nearly all the clerks in the stores are coloured.

The following I consider the advantages of a naval station in the West Indies:—The great difficulty we have of maintaining a fleet of any size in the West Indies is the want of a station of our own. Were we to have a war with an European Power, the rule adopted towards us during the rebellion would, no doubt, again be enforced with the same rigour, and we would have to contend on the most unequal terms with a powerful antagonist having his naval depot close at hand, and who could also, in case of damage in a fight, go into a port provided with means of repair, while in a similar case we should be obliged to go north. Any one can see the disadvantage a government would labour under that had to withdraw a fleet from before a place for the want of provisions and coal, and there is hardly any place in the West Indies where a vessel in time of war could lie in the open sea and transfer stores to another vessel. In carrying on warlike operations a depot is necessary, and here we have the pick of all the West India Islands. The expense of going from the West Indies to one of our ports would be a tremendous item, to say nothing of losing the service of a vessel at a time when she would very likely be most needed. St. Thomas, although not the best harbour in the West Indies, is certainly the most important, the proof of which is the number of vessels that go there for repairs and stores, and it is, for the majority of vessels, the most easily reached. There are so many good points in the harbour of St. Thomas, San Juan, and behind Water Island, that it would be difficult to decide which would be the best place at which to establish a depot. The harbour of St. Thomas itself is well provided with all the conveniences of wharves, buildings, and coal depots that would answer, temporarily, for naval purposes. Every provision is made for the coaling of large steamers, and in no part of the West Indies can a vessel be coaled so rapidly as at St. Thomas. If the government do not desire to go to any great expense, and only wish

the place as a coal depot, there will be no necessity for further outlay. We, in fact, acquire a station already established. In time of war it would not be easy to blockade St. Thomas by any force. No vessels would be able to lie within gunshot, nor could they anchor anywhere in front of the port close enough to prevent a steamer, or any number of them, from going in and out at night. There are no intricate channels through which a vessel of ours would have to work her way of a dark night, but she could run right direct for her port with nothing to stop her. This is not the case with most of the harbours in the West India islands. Cuba, Porto Rico, and one or two of the English islands, are the only places where good harbours exist.

St. Thomas has hitherto been considered one of the safest ports of refuge against those dreadful hurricanes, which, however, are so erratic in their course that first one island and then another feels the effects of their fury. St. Thomas has been less visited by hurricanes than other West India islands, and the harbour of San Juan is the resort of vessels during the hurricane months as a place of refuge. San Juan, St. Thomas, and behind Water Island may almost be considered one harbour, for neither of them are much further apart than Jersey City and East River, and are all very much safer.

There is some doubt about the health of St. Thomas, from the fact that on two occasions there have been fearful epidemics on the island. This, however, has been owing to the absence of all precautions against the introduction of disease. Ships from all parts of the world seek that port. Steamers come and go, bringing invalids from infected ports, and the sick are landed at the hotels in St. Thomas without a question being asked as to what is the matter with them or where they came from. The great quantity of English coal landed there of late years has also introduced sickness for the want of coal sheds over it, and the evaporation of the same in that hot climate, it is said, causes disease. This would not happen with American coal. On the whole, however, St. Thomas is as healthy as any other of the islands, and with proper quarantine regulations would be considered quite a salubrious place. I know that American and European invalids seek it in winter, and there, or at the little Island of Santa Cruz, are soon restored to health.

The outlying islands of the Virgin group are all valuable, in various ways, and capable of cultivation. San Juan and St. Thomas both produce sugar-cane, although the great commercial position of St. Thomas, and the other more easy means of making money, have caused all kinds of agricultural pursuits to be neglected. The people have always been our friends. During the rebellion, when all ports of the French and British West India islands were closed against us, St. Thomas furnished our vessels with supplies of all kinds; gave us information, and turned the cold shoulder to the rebel cruiser. They offered the latter no facilities for preying upon our commerce.

The United States can have direct telegraphic communication with St. Thomas. Wires could be laid from the Capes of Florida across the shoal water which extends, with some interruptions (of not very deep water), as far as Turk's Island, and thence direct to St. Thomas. The

distance would be somewhat greater than to Cuba; but, comparatively speaking, it would not be an expensive line, as there would be so much shoal water.

In fine, I think St. Thomas is the key-stone of the arch of the West Indies. It commands them all. It is of more importance to us than to any one else, and if Europe was at leisure, and its attention not distracted by its own complications, we would not be allowed to get the island on any terms. The chances are that we may not get it yet. The people of St. Thomas may prefer their present independent position to being mixed up with our difficulties.—Respectfully, etc.,

DAVID D. PORTER, Vice-Admiral.

THE EARTHQUAKE AT ST. THOMAS.

WASHINGTON, December 29th.

The Secretary of State has received the following communication:—"The undersigned, Otto Frederick Raupach, a Dane, born in the West India Island of St. Thomas, planter and estate owner in said island, takes the liberty most submissively to lay before your excellency a complete and accurate list of all the shocks and rumbling noises which followed the dreadful earthquake our island experienced on the 18th of November last. My intention is not to give your excellency a scientific description of said catastrophe, but I feel that perhaps the learned societies of your enlightened country may make use of such minute observations as those I have made; and if so, I shall feel highly flattered by your acceptance of it. I enclose the list, and subscribe myself your excellency's most submissive servant, RAUPACH." List of shocks and rumbling sounds which followed the earthquake on the West India Island of St. Thomas on the 18th of November last: The 18th November was a beautiful clear day, with a fine, blue West India sky. The wind was east by north, but very little of it. The ocean was quiet, nearly a calm. The sun shone bright and warm, and the barometer stood at 24 deg. Reaumur in the shade. There was not the least sign of any kind that foretold this great revolution in nature, when at once, just about a quarter to three o'clock in the afternoon, there was heard the underground rumbling noise, which was immediately followed by a terrific earthquake, which seemed to come south by west, and pass on to north by east. The earth seemed as if composed of small waves sinking under your feet, so that if you made a step forward your foot seemed to meet higher ground, and if you put it backward it also there met higher ground. To stand still in one spot was impossible, and when trying to walk it was as if something kept you back. The underground sound, while the first shock was going on, for about one minute and a half, was most dreadful. It terrified every living soul. The sun seemed at once to become dim, it was as if eclipsed, and this dimness lasted that first day until sunset, and continued the whole of the next day, but in a smaller degree, and only wore entirely away in the course of two days more. It was as if the sun, though apparently as bright as usual, had lost some of its warming and illu-

minating power. After the first terrific shock the ground kept on groaning and trembling, when, about ten minutes after, a second strong shock was felt. Directly after this second shock the ocean, which shortly before the first shock had receded from the land several hundred feet, was seen to rise like one huge wave, and come in toward the harbour. It stood up like one straight white wall, about from fifteen to twenty feet high, and advanced very fast into the harbour, sweeping or upsetting the small vessels before it, and raising the large men-of-war and steamers to its top. The appearance of this wave was like a white masoned wall, erect and straight as if made after a rule; it had no appearance at all of a wave in general. It broke in over the lower parts of the town to the height of a couple of feet, and to the extent of about 250 feet inland, according to the level of the locality. This wave-rising was repeated a second time after an interval of about ten minutes, and this seemed to be even a little larger than the first, and went a little further inland. After these two waves had passed away the ocean remained as before, as far as the eye could see, again quite calm, just as before the first shock of the earthquake. The shocks continued, and were felt every few minutes. It was as if the shocks of the first day hung together as in one chain, but from 4.45 o'clock on the morning of the 19th of November, the shocks were felt more separately and distinct, and therefore seemed as if they were more frequent. From 2.45 o'clock p.m. on the 18th to 2.45 a.m. on the 19th, there were eighty-nine shocks. From 2.45 a.m. on the morning of the 19th till midnight there were 238 shocks. The shocks became less severe from the 21st of November. The writer gives the exact hour of every one; also, the hour of every rumbling noise without perceptible shock accompanying it.

At St. Thomas's commercial affairs were still in an unsettled state owing to the continuance of the earthquake. Severe shocks were felt on the 29th and following days up to the time of the *Atrato* leaving, keeping the inhabitants in a state of great anxiety. The island was then healthy but private advices state that the water in the harbour was more putrid than ever through the number of sunken vessels, with provisions, etc., on board. The slightest movement among the shipping caused the exhalation to become insufferable, and it was apprehended that before long some serious sickness would be the result.

The Earthquake in the West Indies.

Commodore Bissell, of the United States Navy, has sent the following despatch to Washington, describing the effects of the recent earthquake in the West Indies upon the war steamer *Monongahela*:—

"United States Steamship *Monongahela*, St. Croix,
November 21st, 1867.

Sir,—I have to state, with deep regret, that the United States steamship *Monongahela*, under my command, is now lying on the beach in front of the town of Fredericksted, St. Croix, where she was thrown by the most fatal earthquake ever known here. The

shock occurred at three o'clock p.m. of the 18th instant. Up to that moment the weather was serene, and no indication of a change showed by the barometer, which stood at 30 degrees 15 minutes. The first indication we had of the earthquake was a violent trembling of the ship, resembling the blowing off of steam. This lasted some thirty seconds, but immediately afterward the water was observed to be receding rapidly from the beach. In a moment the current was changed, and bore the ship toward the beach, carrying out the entire cable and drawing the bolts from the keelson, without the slightest effect in checking her terrific speed toward the beach. Another anchor was ordered to be let go, but in a few seconds she was in too shoal water for this to avail. When within a few yards of the beach, the reflux of the water checked her speed for a moment, and a light breeze from the land gave me a momentary hope that the jib and foretopmast staysail might pay her head off shore, so that in the reflux of the wave she might reach waters sufficiently deep to float her, and then be brought up by the other anchor. These sails were immediately set, and she paid off so as to bring her broadside to the beach. When the sea returned, in the form of a wall of water twenty-five or thirty feet high, it carried us over the warehouses in the first street of the town. This wave in receding took her back toward the beach and left her nearly perpendicular on the edge of a coral reef, where she has now keeled over to an angle of fifteen degrees. All this was the work of a few moments only, and soon after the waters of the bay subsided into their naturally tranquil state, leaving us high and dry upon the beach. During her progress toward the beach she struck heavily two or three times; the first lurch carried the rifle gun on the forecastle overboard. Had the ship been carried ten or fifteen feet further out she must inevitably have been forced over on her beam ends, resulting, I fear in her total destruction, and in the loss of many lives. Providentially only four men were lost; these were in the boats at the time the shock commenced. The boats that were down were all swamped except my gig, which was crushed under the keel, killing my coxswain, a most valuable man. During this terrific scene the officers and men behaved with coolness and subordination. It affords me great pleasure to state that after a careful examination of the position of the ship I am enabled to report that she has sustained no irreparable damage to her hull. The sternpost is bent, and some twenty feet of her keel partially gone; propeller and shaft uninjured. The lower pintle of the rudder is gone, but no other damage is sustained by it. No damage is done to her hull more serious than the loss of several sheets of copper, torn from her starboard bilge and from her keel. She now lies on the edge of a coral reef, which forms a solid foundation, on which ways may be laid. She can thus be launched in ten feet of water at 100 feet from the beach. Gentlemen looking at the ship from shore declare that the bottom of the bay was visible where there was before, and is now forty fathoms of water. To extricate the ship from her position I respectfully suggest that Mr. J. Hanscom be sent down with suitable material for ways, ready for laying down, and indiarubber camels to buoy her

up. I think there is no insuperable obstacle to her being put afloat, providing a gang of ten or twelve good ship carpenters be sent down with the naval constructor, as her boilers and engines appear to have sustained no injury. A valuable ship may thus be saved to the navy, with all her stores and equipments.

S. B. BISSELL, Commodore Commanding.

Rear-Admiral J. S. PALMER, commanding
H. A. Squadron, St. Thomas.

ANTEDILUVIAN SPECULATIONS.

A CORRESPONDENT having appealed to us for information on the subject of fossil ivory, alluded to in our last volume, we have thrown together the following passages concerning it that we have found in our collection. Such remains of antiquity as are there alluded to seem to have been discovered in the Arctic regions of our globe, being left exposed by the washing of the sea or the streams of rivers falling into the Arctic seas, especially those of Siberia, alluded to by Baron Wrangell, and we have met also with them in a very intelligent weekly paper printed at the Sandwich Islands, from which we make the following extract. Frequented as those islands are by vessels of all nations that navigate the Pacific Ocean, and deriving from their proximity to and facility of approach to the Arctic shores, the first information of these curious matters, we consider the authority of the best kind. The following extract to which we have alluded bears the stamp of freshness and originality.

"Captain Taylor, of the schooner *Sea Witch*, lately returned from a trading voyage in the Arctic Sea, brought with him two mastodon tusks, found by the Indians on the Asiatic shore, near Mechigmen Bay, in lat. 65° 30′ N., long. 172° W. From the tips to the roots, which are sawed off square, the tusks are respectively two and a half and four feet in length and about five inches in diameter, and weigh, the largest, forty pounds. As ivory they are remarkable for their peculiar fineness and delicacy of grain. We understand that Captain Taylor intends to present them to the Santa Clara College, California, an institution than which probably none ranks higher on the Pacific."—*Polynesian.*

The coast alluded to is at the entrance of Behring Strait a little to the southward of Cape East on the Tchuktchi peninsula, and these having been sent to St. Petersburgh have given rise to the expedition hereafter mentioned in this paper.

The paper in which the foregoing appears makes the following extract from the *American Eclectic Review*, from information which it obtains from the *London Quarterly Review*. Our readers will also remember the fossil remains brought home from the opposite shore of Behring Strait, found on the shore of Escholtz Bay, by the late Admiral Beechey, when he commanded H.M.S. *Blossom*, and on

which a report by Professor Buckland, in the *Blossom's* voyage, published after her return. How the fossil remains of animals which probably wandered on our earth before the flood in regions of the lower latitudes, came to be placed in the frozen Arctic lands of our globe, may be probably attributed to some bouleversement of the crust of the earth, which it is the province of the geologist to explain. But here is the extract—

"There is another article of commerce of too interesting and curious a nature to be passed over,—we allude to the enormous quantity of animal remains, and especially those of the mammoth, a species of elephant differing from those now existing on our globe; the ivory of which, buried as it must have been for thousands of years, is as sound and perfect as that supplied by the tusk of the living animal. The multitude of these huge remains, together with the bones of a great variety of other animals, that are found along the northern shore of Siberia, and on the numerous islands of the Polar Ocean, buried in masses of ice, and in the frozen mud—banks of the rivers, near their mouths, is almost beyond belief. The traveller here may indeed say,

'I saw the old world's white and wave-swept bones,
A giant heap of creatures that had been;
Far and confus'd the broken skeletons
Lay strewn beyond mine eye's remotest ken.'

Hederstrom, who was ordered to visit the islands, of which New Siberia is one, situated between 74° and 76° of latitude, and opposite to the Cape Swatainos (or the Sacred Cape), paid great attention to these remains.

"'According to his account,' says Von Wrangell, 'these bones or tusks are less large and heavy the further we advance towards the North, so that it is a rare occurrence on the islands to meet with a tusk of more than three pood in weight; whereas on the Continent, they are said often to weigh as much as twelve pood. [That is from 108 pounds to 432 pounds.] In quantity, however, these bones increase wonderfully to the northward, and as Sannikow expresses himself, *the whole soil of the first of the Sachow Islands appears to consist of them.* For about eighty years the fur-hunters have every year brought large cargoes from this island, but as yet there is no sensible diminution of the stock. The tusks on the islands are also much more fresh and white than those of the Continent. A sand-bank on the western side was most productive of all, and the fur-hunters maintain, that when the sea recedes after a long continuance of easterly winds, a fresh supply of mammoth-bones is always found to have been washed upon this bank, proceeding apparently from some vast store at the bottom of the sea.'"

The reviewer, in alluding to the fact of these remains being antediluvian, adds:

"However, although some of our modern sages are hardy enough to deny the fact of a general deluge having taken place, it is a fact for which we have the clear and distinct authority of Scripture, corroborated by the records or traditions of all nations of antiquity and

further confirmed by the actual appearance of the surface of the earth itself; and we venture to hold by the opinion that the flooded earth swept the remains in question away down with the departing waters to the places where they are now found. Cuvier agrees with De Luc and others, who maintain that the impulse of an ocean upturned from its bed, rolling impetuously over the land, carrying everything before it, might well be more than sufficient to roll the dead carcasses of the mammoth to the North Pole. The flood of water to the north is manifested by the slope of the earth's surface towards that quarter, and the general direction of all the rivers which flow into the Polar Sea, in Asiatic Siberia and North America.

"The Baron Cuvier, whose researches were pursued with a vigour and strength of mind that entitle the conclusions drawn from them to the greatest weight, satisfied himself that the flood of Noah, as described by Moses, took place about the time usually assigned—that is to say, from five to six thousand years ago; and he says of this great catastrophe, in his *Theory of the Earth*, that,

"'In the northern regions it has left the carcasses of some large quadrupeds which the ice had arrested, and which are preserved, even to the present day, with their skin, their hair, and their flesh. If they had not been frozen as soon as killed, they must quickly have been decomposed by putrefaction.'"

The two tusks from the *Sea Witch*, are well worthy the inspection of the curious, and we thank Captain Taylor for making us acquainted with these mementoes of the "good old days of Adam and Eve."

The article of commerce above referred to has been incidentally mentioned by Mr. J. Savile Lumley, Her Majesty's Secretary of Embassy, on the Tea Trade of Russia, in his report, stated in May last year. The whole subject however is yet but little touched on, and we shall be very glad to furnish our correspondent with any further information on it with which our readers may favour us.

The annexed is the substance of Mr. Lumley's incidental allusion to it.

About 40,000 pounds of fossil ivory, that is to say, the tusks of at least 300 mammoths are bartered for every year in New Siberia, so that in a period of 200 years of trade with that country, the tusks of 20,000 mammoths, must have been disposed of, perhaps even twice that number, since only 200 pounds of ivory is calculated as the average weight produced by a pair of tusks.

As many as ten of these tusks have been found together in the "Tundra" weighing 100 to 300 pounds each; the largest are rarely seen out of the country, many of them being too rotten to be made use of, while others are so large that they cannot be carried away, and are sawn up in blocks or slabs on the spot where they are found, with very considerable waste, so that the loss of weight in the produce of a tusk before the ivory comes to market is of no trifling amount. A large portion of this ivory is used by the Norman tribes in their sledges, arms, and household implements, and formerly a great quantity used to be exported to China; a trade which can be traced

back to a very distant period, for Giovanni de Plane Carpini, a Franciscan Monk, sent by Pope Innocent IV., in 1246, into Tartary, describes a magnificent throne of carved ivory, richly ornamented with gold and precious stones, belonging to Khan of the Golden Horde, the work of a Russian jeweller, the slabs of which were so large that they could only have been cut out of large mammoth tusks.

Notwithstanding the enormous amount already carried away, the stores of fossil ivory do not appear to diminish. In many places near the mouths of the great rivers flowing into the Arctic Ocean, the bones and trunks of these antediluvian pachyderms lie scattered about like the relics of a ploughed up battle field, while in other parts these creatures of a former world seem to have huddled together in herds for protection against the sudden destruction that befell them, since their remains are found lying together in heaps.

In 1821, a hunter from Yakutsk on the Lena, found in the New Siberian islands alone 500 poods (18,000 pounds English) of mammoth tusks, none of which weighed more than three poods; and this notwithstanding that another hunter, on a previous visit in 1809, had brought away with him 250 poods of ivory from the same islands. The inhabitants on the main land pile up in heaps the tusks which are found scattered about on the "Tundra," and convey them in large boats up the Lena. In the period from 1825 to 1831, at least 1000 poods reached Yakutsk yearly. The trade in fossil ivory at Turuchansk on the Jenissei has for many years past amounted to from 80 to 100 poods annually, and that of Obdorsk on the river Ob, from 75 to 100 poods.

Entire mammoths have been occasionally discovered, not only with the skin (which was protected with a double covering of hair and wool) entire, but with the fleshy portions of the body in such a state of preservation that they have afforded food to dogs and wild beasts in the neighbourhood of the places where they were found. They appear to have been suddenly enveloped in ice, or to have sunk into mud which was on the point of congealing, and which before the process of decay could commence froze around the bodies, and has preserved them up to the present time in the condition in which they perished. It is thus they are occasionally found when a land-slip occurs in the frozen soil of the Siberian coast, which never thaws even during the greatest heat of summer to a depth of more than two feet; and in this way within a period of a century and a half, five or six of these curious corpses have come to light from their icy graves.

A very perfect specimen of the mammoth in this state was discovered in the autumn of 1865 near the mouth of the Jenissei. An expedition was despatched to the spot by the Imperial Academy of Science last summer, and as no time has been lost, the result of that expedition, it is considered, will be the disclosure of some interesting facts in the natural history of a former creation.

The following extract from a recent paper from the same source relates to the notice at the commencement of this article.

THE FROZEN MAMMOTH IN SIBERIA.—At the last meeting of the British Academy of Science, a letter was received from M. De Baer, of St. Petersburgh, in reference to the mammoth, still covered with its skin and hair, which was discovered in the frozen soil of Arctic Siberia in 1864. It was found in the Eastern branch of the Gulf of Obi. The news only reached St. Petersburg toward the end of 1865; but as the bodies of large animals will keep a long time in those regions, if they are not completely uncovered, and as this mammoth was still enclosed in the frozen soil, the Academy of St. Petersburgh has, with the aid of the Russian government, sent M. Schmidt, a distinguished paleontologist, to examine the animal and its position in the locality. It is hoped that M. Schmidt will arrive before the decomposition is too far advanced, and that a correct notion may be obtained of the outer appearance of the animal, and also, from the contents of the stomach, of its natural food. The pre-historical figure of the mammoth, drawn on a piece of ivory, found in a cavern of Perigord by M. Lartet, will then admit of verification.

PEKIN VILLA, ALBERT ROAD,
FOREST LANE, ESSEX.

30th DECEMBER, 1867.

To the Editor of the Nautical Magazine.

SIR,—The abandonment of ships of late years, consequent on the loss of the rudder, more especially that of the *Sir Ralph Abercrombie*, off the Cape of Good Hope, and the *Glenlee*, north of the Equator, has induced me to forward you the following narrative of facts for publication in your Magazine, in the hope that they may be the means of averting such sacrifices of property. And as I am so impressed with the possibility of making a temporary rudder to take a ship to her destination (under even the most unfavourable circumstances); I think such a dereliction of duty should be visited with the severest punishment, even to the cashiering of a Master for any future employment at sea.

Yours faithfully, N. HECKFORD.

HOW A RUDDER WAS LOST, AND A TEMPORARY ONE MADE AND FITTED.

MY attention, during the past few years, having been drawn to the abandonment of vessels consequent on the loss of the rudder, and knowing full well the realities of such a position, from having experienced it, I am therefore induced to lay before you the following statement of facts as they occurred. In the emergency arising therefrom, I am happy to say, as an officer, from my own mechanical knowledge, I was enabled to take that leading part in the planning and construction of a temporary rudder, which, under Providence, led to the safety of the ship, and all on board.

In or about the month of July, 1838, the teak ship *Lord Auckland*,* under command of the late Captain John Wyllie, left Calcutta with a cargo of grain and coolies, bound to the Mauritius. While at anchor in the Gasper Channel the ship struck the ground heavily. On the following day the pilot left us, and we proceeded on our voyage, nothing of any note occurring, excepting that the rudder did not act so readily as it did previous to the ship taking ground as above mentioned. In due course of time we reached the variables and calms, south of the Equator, and then we ascertained that, with the exception of the lower pintle brace, and the upper gudgeon brace, all the rest were more or less broken. Here was explained the cause of the rudder not working freely. Our object then was to ease it off the braces, and this was accomplished with the aid of two three-fold purchases, the upper blocks of which were lashed to the taffrail, and the lower ones to a thick crowbar rove through a hole in the rudder, also the end of an eight-inch hawser secured to it.

We eventually got the S.E. trade winds, in about 7° south, freshening as we proceeded. But much anxiety was felt for the safety of the rudder. However, when within about nine hundred miles of the Mauritius, while blowing fresh in the middle watch one night, the rudder broke at the lower part of the trunk, the fact being readily known by the vessel coming up in the wind. The unpleasant news was immediately communicated to all interested in so momentous an event, and ere many minutes had elapsed, the commander, officers, and passengers, had assembled to consult as to the possibility of saving the lower portion of it, which was then held by the two three-fold purchases above mentioned. But as the rudder was acting like a battering ram when the vessel pitched heavily, as she came to, or fell off the wind; and seeing the probability of its staving, or bursting in the stern ports, it was then resolved to cut the falls, and by the aid of the eight-inch hawser (which had been passed forward) to haul it alongside. This it was considered might be done by the united power of a portion of the crew and coolies, which together amounted to about four hundred and fifty souls.

Whilst this was being done, some hands were employed getting up tackles, for the purpose if possible of hoisting it on board. But this operation proved both dangerous and fruitless, from the terrible blows it inflicted on the hull by the lurching and rolling of the vessel. There was also the risk that it might cause a butt to start, or be the means otherwise of springing a leak; so it was resolved that the tackle falls and hawser should be cut, and the rudder abandoned to its fate. This done, the ship was left, with all the human freight, in a very critical position. The stock of water, etc., having been ascertained, and the future supply regulated, our next object was to employ means to get the ship on her course again as we could, and this was attempted by the use of hawsers on the quarters, and stowing all the canvas on the mizen mast, and then on the main mast, but all without effect, and

* The *Lord Auckland* was one of the most unwieldy ships ever built.

although all possible sail was set on the foremast, with the whole length of an eleven-inch hawser on the lee quarter, the ship still clung to the wind. In the meantime a spare topmast had been weighted and got astern, secured at the fore end by an eight-inch hawser, and a six-inch guy on each side of the after end, assisted with tackles, and by these means the topmast was placed at the greatest angle on the weather quarter, in order (if possible), to get the ship on her course, but without accomplishing the desired purpose.

During the time which had elapsed since the loss of the rudder, I had devised a plan for the purpose of making a temporary one, and it was then in course of construction. I send you herewith a rough drawing of it, in the hope that its adoption by commanders of vessels similarly circumstanced may be the means of rescuing them from the perils to which they would be (otherwise) exposed, and thereby enable them to take their ships safely into port. If so my object will be fully accomplished.*

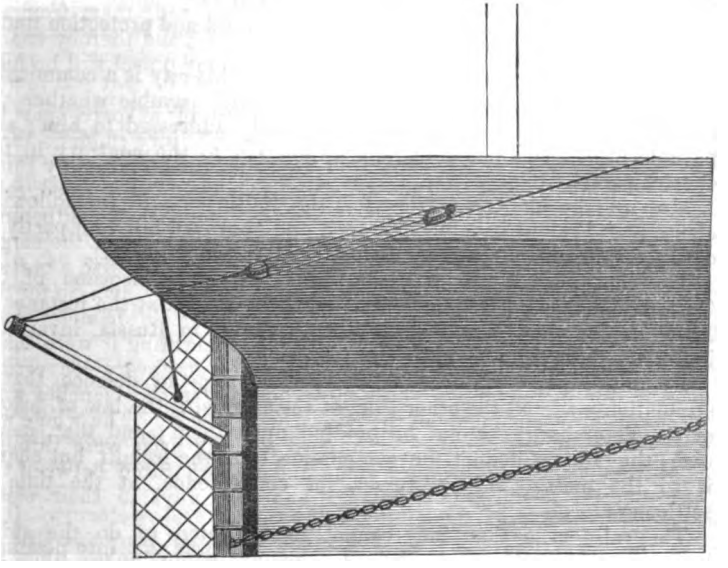
Our resources for its construction consisted of a spare spar for temporary stern post; smaller one for main piece of jury rudder; three four-inch teak planks: one about 18ft. by 14in., one 16ft. 6in. by 14in., and one 15ft. by 13in. broad; about ten planks of hard wood, each 12ft. long, 12in. broad, and 1¼in. thick, for diagonal strengthening. These planks were fortunately on board as side dunnage for the cargo, on account of the charterer, who was a passenger, otherwise a portion of the bulwarks would have been used, or a spare spar sawn up for the purpose. There were besides two small spars 5in. in diameter, each 12ft. long for steering arms. The bolts for connecting it were made from all the available chain hooks, ladle handles, and every convertible piece of iron in the ship. The rings required for the clenches were cut out of the hoops taken off the largest water casks. The whole was well and firmly put together. The two steering arms were through bolted, and clenched on either side; and a chock fitted between the ends, beyond which was a bolt to keep the guys in their place, as is shewn in the sketch.

In the meantime the temporary stern post was got into position, after having been marked according to the ship's immersion, and a pair of guys (made out of the stream chain) well and securely fixed on its lower end, the upper one being lashed to the stern timbers of the cabin windows, which were nearly in a plumb-line with the stern-post. The fore-end of the guys being connected with tackles, which led to one of the fore-ports, and by these means it was firmly held.

The jury rudder having been completed in two and a half days, and a pair of topmast studding-sail booms rigged as shears, it was hoisted over the stern, and then connected with the stern-post by grummets,

* I am led to the supposition that in proportion to the rough specification given in the above narrative, an amount of material is always to be found on board of any vessel for such an object, when bound on a foreign voyage, if not, the attention of surveyors for the Board of Trade, or for Insurance offices generally, should, in my opinion, be specially directed to its necessity.

made from rope *(but should have been partly of small chain)*, also a rope of 6in. to regulate its draught, and to hold it in case of the grummets breaking. The rudder was then lowered to its place, tackles being hooked to the steering guys, the falls of which led to the after-port on the upper deck. The binnacle being fixed at the fore part of the poop, the order was given to the men in the waist, who had been told off for the duty of steering. The jury rudder was then put in action, which the ship quickly obeyed. The necessary sail was set, and a course shaped for the Mauritius, at which port the *Lord Auckland* safely arrived nine or ten days after, without any further casualty worthy of recording.



Such, sir, is a brief outline of the facts, and although nearly thirty years have elapsed since this incident took place, the impressions then created, can never be erased from my memory. If my services were not suitably acknowledged at the time, I have at least the satisfaction of knowing that in the performance of such a duty I contributed materially to the safety of the numerous lives then on board; and that from that circumstance, I claim to be considered the originator of this temporary rudder now brought under public notice.

Yours faithfully, N. HECKFORD,
Late Surveyor of Shipping, Port of Calcutta.

[Various designs for a jury rudder have appeared in the course of this journal. We may instance several in our volume for 1836.—ED. *N.M.*]

Observations on Commercial Legislation at St. Petersburgh.

One of the most frequent causes of complaint at Her Majesty's Consulate is the unsatisfactory nature of the settlements for freight between consignees and masters of vessels. Although the port charges imposed by the Russian Government are exceedingly moderate, freights are unfortunately subjected at St. Petersburgh to a variety of deductions, which, if not absolutely onerous, are nevertheless vexatious, and even in one case, from the standpoint of British and international law, most undoubtedly unfair. A great number of masters of vessels have applied for aid and protection under the following circumstances :—

One of the mercantile charges imposed in this city is a commission of 3 per cent. "for the collection of freight," payable whether the cargo belongs to the consignee, or is only addressed to him; and payable also notwithstanding any stipulation to the contrary in the charter party.

Most of the charter parties for the Baltic contain the following clause :—"Freight payable in a good and approved bill, and partly in cash for ship's use, free of all deductions" (or commission).

The consignee, however, basing his right on a decision of the Commercial Court, given in a case which was tried at the instance of Lord Napier, then Her Majesty's Ambassador in Russia, invariably insists on charging a commission of 3 per cent.

Even the principal English merchants urge in defence that a stipulation made on the other side, at variance with the law of custom at St. Petersburgh, cannot be binding upon them; and that, moreover, they do not deduct the commission from the freight, but charge it to the master of the vessel, for convenience, at the time of settlement.

They also urge that they cannot be expected to do the ship's business, especially if she brings a general cargo, unless they are indemnified for so doing; and in many cases agreements are made for the collection of the freight of a line of steamers in consideration of a certain rate of remuneration, never, however, exceeding 2 per cent. on the amount of inward freight. Other masters of vessels who have signed charter parties stipulating a charge of not more than 2 per cent. commission, have been compelled to pay the full rate of 3 per cent. authorised, as it has been ruled, by the custom of the port. On the other hand, the Russian law recognises as valid and binding, all documents and contracts whatever executed in conformity with the laws of foreign countries.

The exception thus made in the case of charter parties is therefore a constant subject of contention between masters and consignees, and ought to be removed. It is, to a considerable extent, maintained by the connivance of shipbrokers in England, who are not only aware of the inutility of the clause, "free from deductions," but who also not

unfrequently stipulate privately with the consignee on this side that half the commission shall be returned to them.

Until the Law as it now stands is amended, the only advice that can be afforded British shipmasters in such cases is, that they should pay the commission claimed, under protest, and recover the amount from the charterers in England.

But there is another charge which certain German merchants, dealing principally in coals, have recently endeavoured to impose under the title of "discount for cash." These firms cause the shipbrokers on the other side to introduce a clause in the charter party to the effect that the master may receive "cash for ship's use, less usual discount."

A complaint was lodged at Her Majesty's Consulate in August last, by the agents of the *Volunteer* steam ship, against an extensive consignee of vessels laden with coals, who actually deducted discount for cash at the rate of 16 per cent. per annum; and when expostulated with, insisted on his right to charge at least 10 per cent. per annum.

A similar attempt was made by another agent for coals, who, when summoned before a magistrate, was compelled to abandon the charge for discount, which the Exchange Committee formally declared to be illegal, as the rate of exchange at which freights are settled at this port already includes the discount for a bill at three months' date.

In the case of the *Volunteer*, the consignee has appealed from the decision of the Justice of the Peace, but the case has not yet come on for hearing at the Central Court.

The new open courts of law are working very satisfactorily, and will in time exercise a most salutary effect on public morality. The fear of exposure, and the certainty of condemnation in case of guilt, without hope of escape from punishment by means hitherto employed, are all deterrents from dishonesty which, by establishing confidence and credit, cannot fail to promote the internal and foreign trade of the country.

Unfortunately, however, the Commercial Court at St. Petersburgh is still the only tribunal competent to deal with disputes arising within this district out of commercial transactions, and involving sums not under 150 roubles (£23 10s. at par); and it is also alone competent to take cognizance of claims arising out of bills of exchange for whatever amount.

The decision of such a Court being final in all cases involving the payment of less than 3,000 roubles (£475), many commercial disputes are compounded, to the prejudice frequently of those who are in the right, in order to avoid the uncertainty and dilatoriness of proceedings before a tribunal which is partly composed of merchants to whom the Commercial Code is not altogether familiar, and who in most cases limit their activity to an acquiescence with the finding of a clerk, secretary, or attorney.

It is proposed by the Imperial Government to reform the law relating to bills of exchange and bankruptcy, and it is not unlikely that the Commercial Courts will be remodelled at the same time.

Commercial Legislation.—The most important measure affecting trade, introduced by the Imperial Government in 1866, was the abolition of certain small custom-houses on the western land frontier, which yielded but little revenue, and were considered rather as facilities than as obstructions to smuggling.

The tariff was altered on the 17th February, as regards the duty on foreign salt, which can now be brought to all Russian ports without distinction, on payment of a uniform duty of 35 copecks per pud.

The differential duty of 16 copecks per pud, in favour of certain Russian harbours in the Baltic, has thus been abolished.

The only other regulation in 1866, affecting the tariff, was a prohibition to import paper bearing photographic pictures which only appear when dipped in water.

The Customs' Department adopted, in 1866, a new system of valuing the imports and exports in their returns of trade and navigation. After waiting for some time in vain for the observations which they solicited on the scale of prices proposed to be adopted as fixed or official values, the returns for 1865 were prepared in conformity with the projected prices, which are in most cases merely the average quotations of the prices negligently declared for some preceding years.

A convention was concluded last year between Russia and Belgium, concerning the reciprocal right of establishing Joint Stock Companies in the respective countries, with the exception of Companies for Fire and Life Insurance. As the convention stipulates that the rights of all such Joint Stock Companies shall only be exercised in conformity with existing laws in Russia and in Belgium, it does not appear that anything has been gained beyond what is already conceded by the general law of Russia regulating the establishment of Limited Liability Companies.

It is still necessary, before the formation of a Joint Stock Company abroad for the purpose of financial or other operations in Russia, to obtain the sanction of the Minister of Finance to the principal points in the articles of association, and particularly to such as relate to the issue of shares and debentures, and the amount of capital paid up or held in reserve.

Other countries in which the Code Napoleon prevails, have followed the example of Belgium in concluding similar conventions; but the practical necessity for such agreement between Great Britain and Russia has not yet arisen, English Limited Liability Companies already in operation in Russia having obtained a *legal status* without any difficulty.

On the 9th June, 1866, Lieutenant-General Greig, Senator, was appointed Assistant-Minister of Finance, vice Mr. Nebolsin.

Mr. H. J. Atkinson, Mayor of Hull, was presented to their Imperial Majesties the Emperor and Empress at Peterhof, and had the honour of delivering to the Emperor addresses from the Corporation and Chambers of Commerce and Shipping of Hull, congratulating His Imperial Majesty on his escape from assassination on the 4—16 April. Mr. Joseph Wrigley, Jun., representing the united Chambers of Commerce of Great Britain, accompanied Mr. Atkinson, and sub-

sequently made a journey with him to Nijni-Novgorod, and the manufacturing districts of the province of Vladimir.

Mr. Atkinson and Mr. Wrigley were received by their Majesties in the most flattering manner, and obtained encouraging assurances of the solicitude of the Emperor for the development of trade between Great Britain and Russia.

Among the events of the past year, affecting British commercial and shipping interests, the visitation of cholera has unfortunately to be recorded. The epidemic broke out on the 14—26 of June, and progressed in severity until the end of July, when, in consequence of great rains and a low temperature, it decreased, only to break out again with considerable vigour towards the end of August.

It disappeared in October, after making 3,792 victims at St. Petersburgh, out of 17,830 who were attacked, and 476 victims at Cronstadt, out of a total number of 1,061 who were treated for cholera.

The number of British seamen who died, at Cronstadt, of cholera, was sixteen out of forty-one cases brought to the hospital in which temporary accommodation was most kindly provided by the Imperial naval authorities. At St. Petersburgh no death from cholera among British seamen was reported to Her Majesty's Consulate; and the Board of Trade, by their acknowledgment of the services rendered by Dr. Carrick, Physician to Her Majesty's Embassy, have been pleased to attribute this satisfactory result, in a great degree, to the vigorous adoption of preventive measures.

The condition of the British Seamen's Hospital, at Cronstadt, established in 1859, having been found unsatisfactory, it was resolved at a meeting of British shipmasters, held at Cronstadt, on the 11th July, 1866, to establish a new hospital on a different basis. The committee appointed by the meeting have been actively engaged in carrying out their instructions, and, with the liberal assistance of the Board of Trade, the British factory, the Russia Company, and numerous mercantile firms and private individuals, a suitable house has been purchased, and works commenced, which will result in the establishment of a hospital this summer, that will be perfect, if not unequalled, in all its arrangements.

His Royal Highness the Prince of Wales, and Her Majesty's Ambassador at St. Petersburgh, have generously contributed towards the funds of the institution, and have been pleased to become its patrons.

St. Petersburgh, 1867.

THE COAST AND HARBOUR-LIGHTS OF THE WORLD.

WE perceive that our Government Hydrographic Office of the Admiralty has just completed their series of Pamphlets, containing a tabulated and comprehensive description of the various Lighthouses and Light-vessels on the sea coasts of the whole world. This informa-

tion which is comprised in pamphlets varying in size from seven or eight to something above seventy pages is thus made accessible to all navigators at prices varying from six to eighteen pence, although compiled purposely for the use of the ships of the Royal Navy. When we see the large amount of information which they contain, it becomes evident that it is only in a public office in free communication with all other governments, that such a mass of official knowledge could by official means only be collected; and it must be as freely admitted, that, the ships of the State, as well as of the Mercantile Marine of this country, are highly favoured in having a government that can place such an amount of knowledge essential to navigation at their service, not only of their own fleets, but also of those of the whole world, at such prices as we have named. Is a ship of any kind foreign, or English, bound to the shore of some distant, or proximate sea, her master must be held to blame if he trusts alone to any chart of that sea, when for a few pence he can be assured that up to the end of the last year, he can provide himself with an official account of the lights of its coast. And yet we fear that it is too often the case, that a ship would be found navigating, not only with no such information as any one of these pamphlets would supply, but also with some old chart, which has been all but worn out in her service, and has not undergone correction for many a long year, although such things we have long ago said give "frequent occasion for revision and amendment."

Let us place the names of these Lighthouse pamphlets before our readers. They are entitled, "Admiralty Lists of the Lights:—1. The British Islands. 2. The North and Western Coasts of France, Spain and Portugal. 3. The Mediterranean and Sea of Azov. 4. The West Coast of Africa, South Africa. 5. East Indies, Red Sea, China, Japan, Australia, Tasmania and New Zealand (an extensive Navigation which seems likely soon to require redivision). 6. South America and the Western shores of North America. 7. The West India Islands and adjacent coasts. 8. The United States of North America. 9. The Coasts and Lakes of British North America. 10. The North Sea, Belgium, Holland, Hanover, Denmark and Norway, the Baltic and White Sea.

So extensive an amount of specific information as is contained in these pamphlets on which the safety of our ships depends, with not improbably the lives of all on board, could only be accumulated by official means and dispensed to all seamen with the utmost possible care to render it worthy of the confidence placed in it, and we may add, that not only does such a compilation reflect the highest credit on the government which collects it, but also on the individual officer, whose duty it becomes, to arrange it under its several divisions; but also to take good care, that it corresponds with the information received;—a duty, which has long been most zealously performed by Commander E. Dunsterville, R.N., whose name they severally bear.

The November Hurricane at Calcutta.

We have just received a small pamphlet entitled, "Remarks on the Great Storm that blew over Calcutta on the First and Second of November, 1867," by Geo. A. De Penning. Printed at Calcutta, 1867. Now, although we had not looked into the particulars of this "great storm" of November, yet knowing that the period of the year at which it occurred was the principal time at which they take place, we had concluded, of course, that it was one of those circular storms for which the northern parts of the Bay of Bengal are celebrated; and which have been so amply treated on by the late Mr. Piddington. But our surprise was great on reading in Mr. De Penning's pamphlet, that although this storm was one that, "Mr. Blandford, the Meteorological Reporter, pronounces to be a cyclone, we (that is, Mr. Geo. A. De Penning) are by no means sure that it was a rotatory storm" (p. 4), and that, "in fact many of its phenomena went rather to indicate that it was more a tempest, or rectilinear storm, than a hurricane or a rotatory one."

Well, we exclaimed mentally, let us see Mr. De Penning's reasons for this conclusion, and reading on, we found him, after alluding to the "steady fall of the barometer," and the "N.E. trade being 'drawn out,'" indulging, as a reason why this was no circular storm, in the following paragraph, which we preserve here entire, if only to shew (with some other data afforded by Mr. De Penning hereafter) how opposite are the conclusions that can be drawn from the same statements. Mr. De Penning, italicized by us, says, in page 6 of his pamphlet, "We had next *the change of the direction of the wind*, or the gyrations to indicate its nature, and we found that from the north-east, instead of veering in (what has been called by Dove) the natural order, that is, *from north to east*, it began to back against order, or to gyrate *from N.E. to north and towards west:* now these gyrations which in the temperate regions (or those of natural gales) are almost a certain indication of the advent of a rotatory storm, are here the very reverse, as proved, they being the clear index of a tempest such as we have experienced."

"Besides this," adds Mr. De Penning, "there were other circumstances, or phenomena, that *must lead us* to the conclusion that this was *not a rotatory storm.*" That little word "us" will not, we are quite satisfied, include a single sound pupil of Redfield or Piddington, although it may serve along with his reasoning, not only to convince Mr. De Penning of the justness of his conclusion, but also may encourage him to assail, as he has done, the whole hurricane theory as a myth. It is fortunate, we say, for our seamen, that they had not Mr. De Penning for their instructor, or they would have been as much mystified as he has been after consulting Dove. The hurricane theory will have no fatal enemy in Mr. De Penning, and it is a consolation that his reasoning is against himself.

Does Mr. De Penning admit the revolving theory? Perhaps he

does, and if not he has had pretty good proof in all hurricanes before this that they do blow round a focus or centre, which focus, along with the whole meteor, travels in a certain direction. Now let us take his own statement of the direction of the wind in Calcutta given at page 9, and place against it the bearing of the focus as it progressed onwards in its course; and we shall have the following :—

	P.M.	Wind.	Bearing of focus.
1st Nov.,	7	N.E.	S.E.
	9	,,	,,
	10	,,	,,
	11	,,	,,
	midnight	N.N.E.	E.S.E.
	A.M.		
2nd,	0.30	,,	,,
	0.45	,,	,,
	0.50	North	East
	1.0	N.bW.	E.bN.
	1.15	N.W.	N.E.

	A.M.	Wind.	Bearing of focus.
2nd,	1.20	N.W.	N.E.
	1.45	West	North
	2.0	W.bS.	N.bW.
	3.0	West	North
	4.30	W.N.W.	N.N.E.

Barometer at 7 p.m. on the 1st at 29.84.

,, 3 a.m. on the 2nd at 28.92, rising, and the hurricane went off to the East, the wind at North.

Now we would ask, what rectilineal movement of the wind is there here, where its changes have been from N.E. round by North to West, at which time the hurricane by the rising barometer may be looked on as past, and with its focus gone away to the northward and eastward. Had we met with such a gale at sea, we should have treated it as a revolving storm, which had come up from the S.E., overtaking us, and without crossing our position had gone away to the North and N.E. And again it appears (in page 32) that at Berhampooter and Khoolora the wind was veering from N.N.E. through East to South—from which may be concluded that those places would be in the right hand semicircle of the hurricane, while the previous observations of Calcutta shew them to have been made in its left hand semicircle. But we have not a chart at hand that would shew us the relative positions of those places. However this may be, Mr. De Penning adds, regarding the Berhampooter observations, that the information as a necessary consequence of those winds after all, that, "we have evidences of a cyclone, which must either have been gyrating with the hands of a watch, or must have been approaching the equator, instead of receding from it, either of which *circumstance* is opposed to the accepted laws of such storms."

Really one would conclude from such remarks as these that we ought to shut up our books, and condemn the hurricane theory as all fudge. But fortunately it is well-known (although it does not seem to be at all clear to our author) that on different sides of the line of progression of the focus, or in different semicircles of the hurricane, *the changes of the wind will take place in opposite directions*—that is, in*

* In illustration of this, see page 11 of THE STORM COMPASS; *or, Seaman's Hurricane Companion, containing a familiar explanation of the Hurricane Theory, by* Commander A. B. BECHER, R.N., F.R.A.S.—*Potter*, 31, *Poultry, London*, 1853.

one, from left to right; and, *in the other, from right to left*—at places over which it passes being on different sides of the line of progression. We thought everyone was aware of this fact.

In the volume of this work for 1836, we were among the first to publish Redfield's theory to the world—his chart with his paper describing the tracks of several hurricanes stands in the April number of that volume at page 208, since which it has been verified in both hemispheres both east and west, and his beautiful discovery verified, that in both those hemispheres the *hurricane wind which is next to the equator always blows from west*, a principle which whether in north or south latitude enables the navigator with a piece of chalk or a pencil and a leaf of his watch-bill, to know the direction in which the focus lies of him, and thence by the usual paths which they follow, how to avoid it.

The whole matter as we have said long ago, lies in a nut shell: it needs no large volumes like Family Bibles for expounding, and the Seaman Commander who has not the theory at his fingers' ends on emergency is unfit for his command. But unless he has got his lesson from such authorities as Redfield, or Reed, or Piddington, he will assuredly be adrift if he trusts to such doctrine as that before us. Yes, we quite agree with Mr. Blandford, that this was a revolving storm, the focus of which certainly passed to the eastward of Calcutta, and (from the observations made at Canning) that the focus of it also passed over that place, and that there was no retrogressive movement of it towards the equator so erroneously urged by Mr. A. De Penning.

Like the recent hurricane at St. Thomas Island on the 18th of November, although of short duration (not more than six or eight hours) the damage done by it has been most severe. The following account of its severity is brief but shews that at Calcutta about a thousand lives were lost besides somewhere about 30,000 huts destroyed.

"CALCUTTA, Nov. 9.—On the night of Friday, the 1st inst., a cyclone raged in Bengal, extending according to present information from the Bay northward to Serazguni, westward to Midnapore and Burdwan, eastward to Burnsaul and Dacca. The rice crops throughout the track visited by the cyclone are greatly injured. In many places it is estimated that not one-fourth will be saved. Many buildings have been destroyed, and also boats on the inland rivers laden with jute and grain. Large quantities of the growing jute have also been destroyed. Great damage has been done at Port Canning. A storm-wave nearly six feet high carried away a portion of the river bank jetties; the railway is much injured and the station destroyed. At Calcutta the cyclone lasted nearly eight hours. It is estimated that it has done more damage to the city than the great cyclone of October, 1864. In the city suburbs more than 1,000 lives have been ascertained to have been lost, and 30,000 native huts destroyed. Tugs and other vessels have been wrecked at Saugor. Several vessels are missing and several ships are returning disabled; more than 600 native boats have

been destroyed. The steam transport *Euphrates* has put in at Calcutta to refit, greatly injured. At Burdwan much distress has been occasioned among the native population. The telegraph line along the Ganges has been thrown down. In Bengal great distress is reported. The Bengal government is actively engaged in taking measures for the relief of the sufferers; the Board of Revenue is co-operating with it. The Famine Relief Committee are collecting funds. The Lieutenant-Governor has announced that the government will double the amount of the subscriptions raised. The Chamber of Commerce has issued an appeal for subscriptions."

The *Calcutta Englishman* learns that the *Euphrates* carried away her moorings at 12.5 on the first and was on shore for four and a half hours. She was got off, but is much strained from bumping. The damage sustained is not yet known, but she does not leak much. Her boats were stove in, and the saloon deluged with water. We understand that she will not be able to take the troops at the time fixed, and must come here to be refitted. It is reported that had the *Euphrates* gone a few hundred yards in another direction, she would have sunk and disappeared on the Diamond quicksand.

The Indian and Atlantic Telegraphs.

(Continued from page 75.)

As soon as the scheme was announced in a few days about half the required sum was subscribed. The conditions were in preference shares. And from the results of the rapidity of the signals transmitted in the course of laying down, it was estimated that on the capital of the second company fifty per cent. would be gained at least, without reckoning on the further profit after the interest of the former company had been paid. The second cable was made during the winter as it was passing, and in the spring it was coiled away in the tanks of the *Great Eastern*, and this vessel departed from the harbour of Berehaven where she had filled up coal and taken on board provisions for her voyage for several weeks. It was known that the cable of 1865 by experiments at Valentia remained in its usual condition from the time of its fracture. The shore end had been already deposited from the *William Corry* to about twenty-five miles from the shore, the termination of which was marked by a buoy from which the *Great Eastern* was to commence. The vessels employed in the work consisted of the *Great Eastern*, the *Terrible*, a steam ship of the Royal Navy, and two other steamers, the *Albany* and *Medway* of 1800 tons each. The two last had taken on board the apparatus for recovering the lost cable, and on proceeding with their work the *Terrible* it was arranged should lead the rest. The *Albany* and *Medway* would keep one on the port and the other on the starboard bow each at a short distance to lay down

buoys or attend to the signals of the chief of the expedition. It was ordered that the rate of progress should never exceed six knots. Each commander was informed where it was intended the cable should cross the meridians of longitude, so that there were a number of points to follow at which in case of separation by fog or otherwise, they might re-assemble. Such were the arrangements, besides many others, prepared beforehand. The whole operations had been previously determined on, and it is remarkable that they were mostly carried out. On the 13th of July, at half-past three in the afternoon, the junction was completed between the shore end and the cable, the *Great Eastern* got on her way under the salute of the squadron.

The route to be followed was about twenty miles to the southward of that followed in 1865. The sea was calm and the weather fine, the cable was veered out without difficulty and fell with an easy rate into the ocean bed. Testing signals were exchanged without interruption through the cable between the vessels and Valentia. They received Greenwich time so that each ship might know the error and rate of her chronometer, and by means of the cable the ships were informed of the opinion of those on shore in regard to the enterprise, the most recent intelligence of European matters, the course of the exchange, etc. A lithographed journal of the *Great Eastern* was distributed twice a day to the passengers of the *Great Eastern*, called the "Great Eastern Telegraph," and every thing went smoothly up to the 18th of July. At half-past five in the evening of this day the alarm signal announced something wrong. The engines were stopped, the ship's way checked immediately, and every one flew to his post anxious to know the cause of alarm. It turned out to be nothing, but had the good effect of shewing that everything was ready, and each one knew his duty in case of accident. But in the course of the evening there was some reason for fears. The cable was becoming foul at the bottom of the tank and it was necessary to stop paying out to clear it, to place a buoy on the cable as a precaution, and to do this in blowing weather. The greatest difficulty was to keep the vessel in her position by means of her paddles and rudder while this was done in spite of the wind current and heavy sea. But the skill of the commander and the engineers overcame every difficulty, and in less than a couple of hours all was right again. On the 19th the wind freshened and the vessel rolled considerably, which interfered with the veering of the cable, and two large buoys were prepared in case of it being necessary to use them.

The *Terrible* was lost sight of in the fog, the *Albany* and *Medway* preserved their distance but with much difficulty. The vessel's way was slackened with the view of lessening the risk. Notwithstanding these difficulties the slack of the cable did not exceed above fifteen or eighteen per cent., and at the same time as the immersion advanced the signals with Valentia became more rapid as well as regular. The isolation had improved as had been already found as the cable was subjected to the lower temperature as well as the enormous pressure of the deep sea. On starting not more than a word and a half per minute

had passed through the cable: about halfway across the electricians received four or five, and now declared that the powers of the cable were still increasing.

On the 23rd, as they were not more than seven or eight hundred kil from Newfoundland, Mr. Cyrus Field begged his friends in England to send him the most interesting European news, that it might be communicated to his friends without delay to the principal places of the United States as soon as they should reach the American coast.

As the expedition approached the coast of Newfoundland the weather became more rainy and foggy. In fact a thick fog completely concealed the different vessels from each other, so that they could only know of each other's presence by means of the steam whistle. They were now on the banks, and the depth which for some days had been about two miles on the 26th July, was not more than from five to six hundred metres. Before the expedition left England it had been agreed that Admiral Hope, commanding on the North American station, should direct one of the ships of his squadron to convey it to the bay in which the cable should be landed, and the *Albany* went ahead to look out for this vessel, and to reconnoitre the coast. On the 27th the squadron made the land at nine a.m., and the *Great Eastern* came to an anchor in the middle of Trinity Bay. The shore end having been previously prepared, all that remained to be done was to connect it with the cable which she had on board, and this being done a direct communication was thus established between Newfoundland and Valentia.

As the first piece of news conveyed by the cable the people of Newfoundland learnt that an armistice had been signed three days previously between Prussia and Austria. Well might this be looked on by them as a wonderful phenomenon, one that in its rapidity annihilated space, anticipated even the course of the sun in its daily course, and connecting people in facile intercourse, thus distantly separated by the wide ocean. Well might they be astonished at the wonderful effects of electricity, so odd in its effects, so easily managed, and so ready to fly by the channel prepared for it, ready to return with an answer to its own message. Light and heat are its agents which have often disappointed the wishes of its masters, but here realising all that it promised, it performs what no other terrestrial force can possibly accomplish.

The part of Newfoundland where the cable is brought has been in communication with America since 1856 by an electric cable laid across the Gulf of St. Lawrence. Unfortunately this cable had been broken the year before and not repaired; but once in America and all the lines were in order. The New York, Newfoundland, and London Telegraph Company to which it belonged proposed not only to repair this cable, as it had done before, but also to lay down two others in order to secure a ready means of transmission for the Atlantic cable. And here it may be observed this company possessed, one knows not why—the exclusive right for fifty years from 1854 to lead cables to the coasts of Labrador, Newfoundland, and Prince Edward's Islands, and for twenty-five years to the coast of Maine.

The services of the *Great Eastern*, however, were not terminated with having safely landed the cable of 1866; there still lay at the bottom of the Atlantic that of 1865, lost in the preceding year. And having received fresh supplies of provisions and fuel, the great ship was now bound for the scene of that disaster, which after some twenty days of trial she succeeded in recovering. The cable of 1865 has been fished up at the distance of over 600 miles from Newfoundland, and completed to Newfoundland, as we have already related in these pages.

When one considers the whole subject in its minute details of these two operations of ocean telegraphy, one to India and the other to America, they cannot be viewed but with sentiments of admiration. One sees the union of science and energy in carrying out a scheme worthy of them that is doing a signal service to the civilized world. Such claims to the admiration of the whole world must not be met with the sinister remark, that their labours have happily been attended with good fortune. Having for many years watched with extreme solicitude their attempts, their labours, and their first failures, we venture to say if they had not succeeded this time, they had done everything they could to ensure success. This is no eulogy. We may say again, that in writing the history of ocean telegraphy, one fault or neglect may be traced as accompanying each disaster, sometimes in forgetting the first principles of science, and that in the two enterprises above-mentioned, everything had been prepared with the most scrupulous care. But it is not sufficient to scan the proceedings of telegraph engineers from a technical point of view. Every work of this kind is not only an instrument for public use but a financial enterprise. What the power of submarine cables consists of, and what they might effect in the hands of their fortunate proprietors we may hereafter consider.

The essential quality of electric telegraphy is its rapidity. We are so accustomed to the idea of a telegram from any place to another, however far it may be, arriving within an hour or so, that we are induced to expect the same should it have to go even to a distant country. Far from this: for great distance it is not a question of hours, but of days. These delays, sometimes inevitable, arise sometimes from a bad organization, and have contributed as much as the breaking of the cables to shake public confidence, to which, at least, the ocean telegraphy is well entitled. Let us take an example from the Indian line, an object of so much expense and solicitude to the Government. From correct statistical tables the imports and exports from the East, or Egypt, India, China and Japan, are valued at a sum which is more than one-fourth of the commerce of Great Britain. She cannot pay too dearly to secure a rapid and regular intercourse with those countries. But it is not commerce only she wants. Political matters, and military events become simplified as soon as the colonies are in electric communication with the mother country. What may not come from this Indian telegraph which has been established with so much cost. The *Indian Times*, a Bombay Journal, said on the 8th of June last, that the most recent news received from England was six days old. In the

month of May messages were a month on the route: the most rapid arrived in two days. But one is astonished when following the progress of one of these despatches at the number of delays which it has to undergo.

Between London and Bombay a telegram may go by the Russian or Constantinople route. By the former the English company which has received it, sends it through Holland to Berlin: it enters Russia, crossing that empire to Tiflis, goes into Persia to Bushire by the submarine line: from thence it is sent to Kurrachee, and thence to Bombay. By Constantinople it is still more complicated in its progress. Without alluding to intermediate delays, it goes from Brussels to Vienna; crosses Servia and Wallachia to reach the Ottoman territory, or perhaps it goes to Paris and Turin, passes through Italy, crosses the Adriatic by a cable between Otranto and Vallona and reaches Constantinople by Salonica. From Constantinople to the Gulf of Persia there is but one route, the line established between Diarbekin and Bagdad, but before arriving there, the telegram has been in the hands of four or five different administrations. In most European countries an expert regular staff has been organized, but in Turkey it is not so. Native indolence has not yet been overcome even by electricity. The chief of the establishment at Fao writes that at the establishment at Bagdad they say they have 70 or 80 despatches on hand: having sent off twelve or fifteen they take their pipes or go to prayers. For three hours nothing is known of them. (So says the report of the committee in July, 1866.) To this we may add that the Russo-Persian line, which often supplements the Turkish deficiency, is interrupted in a part of the winter by the snow, and that the Indian station to the east of Kurrachee is no better than the Turkish one, requiring fifty-six hours to send a despatch from Kurrachee to Bombay, and one hundred and thirty-three hours from Kurrachee to Calcutta.

This Indian mail which starts once a week requires but twenty-four days to travel the immediate distance from London to Bombay. If the telegraph does not guarantee that the despatches confided to it shall travel much faster than the mail, without doubt it is imperfect and affords abundant reason for the complaints of it. It is in fact an admirable means, the value of which is lost from causes which defy the power of the engineers. Such delays affect the pecuniary interests invested in the Indian line. During the first four months of the present year the Persian Gulf cable has transmitted 10,995 messages, which have produced in round numbers a sum of 864,000 francs. The number would no doubt be still greater if the cable had greater powers. Comparing this with the produce of the Malta and Alexandria cable which connects less important countries, but the delays are much less. From three to four thousand despatches per month have been transmitted, although the commercial importance of Egypt is very limited. Subtle as the electric fluid may be, its application to great distances it may be seen is shackled by difficulties arising more from the mode of applying it than from the principles of the science. As may be expected the perfection of the telegraph every-

where is in proportion to the civilization of the people, and the distance of the line whether on shore or by sea will always be a source of delay. So we will give but brief attention to a work of the same nature which is going on in spite of every obstacle across the frozen regions of Behring Strait.

For a long time the Russian government has undertaken to lay down an electric cable across the frozen steppes of Siberia. The line first extends from Petersburgh to Kiatchta, a little town on the frontiers of China, which is to be continued to the south of the Gulf of Pechili, which will bring Pekin in connection with Europe. To the east the line will reach Nicholasvessk, a military port of great importance at the mouth of the Amour. This is the project of the Russian government, but an American has proposed to give it an altogether different course. Their plan is no less than to connect Nicholasvessk with San Francisco in California, passing by the north. From the mouth of the Amour they bring it towards the bay of Penjinsk, either along the shore of the Okhotch sea, or by a submarine cable across it. From that bay to the Gulf Anadyr by land, and there would no doubt be one of the most difficult points to establish. Beyond this, the line would become submarine to the islands of Nounavik and St. Matthew, to approach the American coast at the head of Norton Sound. The sea distance would be little, keeping to the northward, but the severity of the climate is such that the work could not proceed more than during three months of the year. Once on the American continent, the cable would be continued to the south without quitting the coast; it would connect with Sitka the Russo-American capital, New Westminster on the banks of the Fraser river, and thence to Victoria, the capital of British Columbia. This last place is already in connection with San Francisco, and consequently with all the United States' towns to the shore of the Atlantic.

A SKETCH AT HAWAII, AND SOMETHING ABOUT THE MORMONS OF THE SANDWICH ISLANDS.

THE Sandwich Islands discovered nearly a century ago by Cook, are fast assuming that importance in the civilized world to which their advantageous position in the Pacific Ocean entitles them. They contain a large population besides many matters of much interest—besides their enormous volcano which far transcends Vesuvius, of which we are occasionally told, while the former is scarcely known.

We propose in some future numbers to lay some of its scenes before our readers, for if we mistake not they are destined before long to be a point of enquiry and resort in the approaching circumnavigation of the world. We commence with sketches at Hawaii, called by Cook Owhyhee, and something of the Mormons of the Sandwich Islands.

The country lying between Kealakeakua Bay and Kau is probably

the most barren and uninviting portion of the island of Hawaii. Frequent volcanic eruptions from Mauna Loa have sent streams of lava down its sides, leaving utter devastation behind. Over this rocky waste, attempts have been made to construct a horse-road, which in some places is perhaps better than no road at all, but nowhere throughout its length is it what it ought to be, or what it might be made with proper skill.

It was for a ride through this district that we set out for an early start, well prepared for a tedious journey by a hearty breakfast at the generous table of our friend Captain Cumings, whose quiet and peaceful domicile no one can leave without breathing warm *alohas* to its kind-hearted host and hostess. The sun was already up—such a sun as only shines over the sweltering Kona districts of these islands. Our mules started off at a good pace, but as there was no danger of their running away on these roads, we gave them slack reins. For the first ten miles the road runs along the coast, then gradually rises up the mountain till it enters the woods at an elevation of some three or four thousand feet. The heat and dryness of the lower roads are here exchanged for constant showers and cold, damp atmosphere. Rapid travelling is out of the question, and the traveller unaccustomed to the road must be content to move at a slow pace.

We had progressed some twenty-five miles from Kealakeakua Bay, when, about three p.m., we reached a cluster of native houses, which appeared to offer a good stopping-place for the night. Dismounting, we entered a newly-erected grass house, into which the owner had not moved, but where we were invited to make ourselves at home. Hardly had we seated ourselves before a cheerful fire, when we recognized two faces, which we had frequently met in Honolulu. We soon learned that this hamlet was located in the midst of the *fungus* district, and that these natives, formerly residents of the metropolis, were engaged in gathering this article. No sooner were we recognised, than they set about preparing a meal for us, and a fine cock, which jumped on the raised sill of the door to greet us with a cheery welcome, was the next moment dancing about—his head here, his body there. A short hour found us seated around a semi-civilized meal, consisting of stewed chicken, taro, bananas and poi, all which were enjoyed with the keenest relish. Here we were, on the side of Mauna Loa, four thousand feet above the level of the sea, in the midst of the dense forests that cover the mountain, the chilly air and constant rain making fires a necessity—here, twenty-five miles perhaps from any foreign dwellings, we were enjoying the hospitality of native Hawaiians. Say not that these rude natives are uncivilised, or that they have not planted in their bosom the first principles and the true spirit of Christianity. We say it with pride, and point to it as an evidence of the progress of civilization here, that nowhere else in the world have we ever met from strangers a kindlier hospitality or had our wants more cheerfully supplied, than among these rude mountaineers.

We were now in the *fungus* district, and improving the few hours

of daylight that remained, took a ramble in company with the natives, to observe the mode of collecting this article, which is becoming so important an export. Perhaps all who read this may not know that *fungus* is an edible excrescence growing on the trunks or limbs of decaying trees—a sessile protuberance or wort, from one to three inches long, so much resembling a human ear in form, shape, and appearance, that the only name by which it is known in the Hawaiian language is *pepeiao laau* or *tree ear*. This excrescence grows on the trees as mushrooms grow on a manure heap, a crop of them starting up after each soaking rain. A few days only of wet weather are sufficient to produce a large crop, and the natives told us that they generally went over the same ground once a week, gathering a larger or smaller quantity according to the amount of rain that has fallen. The gathering of *fungus* is the easiest work imaginable—a child picking the "ears" as rapidly as a man. When the *fungus* is picked it is thrown into a bag which hangs from the shoulder or is carried in the hand. When gathered it is generally wet. The *tutui* tree yields by far the larger portion of the *fungus* gathered, probably three-fourths. Besides this, some is gathered from the *koa*, *aila* and *hau* trees, but the product of these is not considered equal to that of the *tutui*. It is only on the *dead* trees that it grows, consequently many trees are cut down for the purpose of supplying the article.

It would seem hardly possible that the gathering of fungus could be made profitable, yet a little inquiry satisfied us that those engaged in it received better compensation for their labour than natives living in Honolulu. An active man can easily gather one hundred pounds a week, but generally each labourer does not average over fifty pounds, owing to the fact that rainy days are frequent, and there is no incentive to spur them to constant industry. The fungus, when gathered, is carried by the natives to their houses nearer the sea, where a hot sun effectually dries it. Here it is packed in large, bulky bales, and shipped by the schooner *Kekauluohi* to Honolulu, one-half cent. per pound being paid for freight. On reaching Honolulu, it finds a ready market, and is eagerly bought up by the Chinamen, who pay seven and a half cents. per pound in cash for it. Thus it will be seen that an active native can earn *seven* dollars per week at this new and almost unknown branch of industry.

Fungus is an article of food—a luxury—consumed by the Chinese in and about Canton. It is used by them in soups and broths, as we use maccaroni, and also serves as a medicine, of which a kind of tea is made and used in some cases of sickness. To look at these "ears," as they lie all shrivelled and dried up, one would not dream that they could be used as food. Yet who has not relished sweet and tender mushrooms, when properly cooked, which are considered a dainty in large cities! So, too, with fungus, when cleaned and prepared in the hands of skilful cooks, no luxury is more relishing. It is so expensive that only the higher classes in China can afford to indulge in it. Formerly, this article was brought from the Northern provinces of China to supply the Canton market; but of late years the troubles of

the rebels have so deranged trade that only small quantities are obtained from thence. The Chinese fungus grows mostly on the mulberry tree, and is far superior to any that is imported, being much more tender and sweet.

When the fungus is bought by the Chinamen in Honolulu, for which cash is generally paid, it is taken to a storehouse, and, after being thoroughly dried, is packed in clean white cotton bales, about four feet in length, but, owing to the nature of the article, very light, the bales weighing generally about 75 lbs. It is then stored to await the arrival of the Hong Kong packets, which call at this port from San Francisco now pretty regularly every month. Some time ago 49,283 lbs. were shipped off to that port. In China our island fungus commands now about 20 dollars per picul of 133⅓ lbs., or about 15 cents. per lb., the price frequently dropping to 12, 13 and 14 cents. It thus affords an excellent remittance for our Chinese merchants, better than gold or silver, which can only be sent at a loss. The China fungus, as we have before remarked, is a choicer article, and commands 40 dollars per picul, or about 30 cents. per pound.

Our readers will thus see that we have opened here a new and novel branch of industry, affording a livelihood to a considerable number of the natives on each of the islands, though Hawaii supplies by far the larger portion. The amount of fungus exported this current year will probably not be less than 500,000 lbs., of the value of 35,000 dollars. The crop is, however, an uncertain one, depending wholly on the rains and a wet season for its success, but probably twice that amount could be sold if gathered.

We returned to our humble cottage and mats, much pleased with a ramble of two hours through the woods in search of new ideas about wooden "ears;" and the evening being cold and rainy, we were soon lost in slumbers, hastened on perhaps by a fatiguing ride of four hours in the rain, and the incessant jabbering of the natives.

As the subject of Mormonism amongst the natives seems to be resuscitated just now, will you let me tell you what I have seen of it in my neighbourhood since it was first introduced here. Between nine and ten years ago, as well as I remember, some persons, professing to be Mormon teachers, first made their appearance on this side of Oahu. I used to meet them frequently travelling from place to place, on foot generally, sometimes singly, sometimes in pairs. They were generally stout, active, able-bodied young men, some American, some English. They came on several occasions to my house and demanded quarters of any kind for them. On two occasions they forced their way into the house, and attempted to convert me, and I must observe that the three men who did so, were three of the most perseveringly impudent fellows I ever met. Once I put on my hat, went out and requested of them (there were two) to go out also, as I wanted to lock my doors. One of them told me not to put myself to any inconvenience, that if I had anything to do I had better go and do it, that he was very well where he was, and would wait till I returned. I peremptorily declined the favour.

Another whom I informed very civilly that I had no accommodation for him, persisted in his demands for a bed and supper, (he had travelled seven miles that day) and when I told him that as I was not one of his disciples, and did not intend to become one, and as he knew where there was a house of one of his converts in the neighbourhood, I thought he had better go there, shook his scrip and his staff (*he* had a scrip, it was a shiny black bag with a brass lock), and prayed that the Lord might reward me according to my works. Then suddenly from imprecations he burst into prophecy, and shaking the shiny black scrip with the brass lock in one hand and the staff in the other, exclaimed vehemently, "and He will, young man! He will! you see if He don't!"

Another remonstrated with me very indignantly for refusing to give timber to build a Church (a kind of small thatched Zion), and told me that it was a *shame* to persecute them; that it was no wonder the natives were so niggardly in refusing support to the Elders, when foreigners, who ought to know better, set them such an example. "See here," he said, showing me a crack in the side of one of his boots, "I have worn out this pair going round preaching and baptizing, and now they refuse to subscribe five dollars to buy me a new pair." As the Latter Day Saint had come uninvited to my house and had himself broached the subject of his shoeing, I thought I was entitled to offer an opinion. I told him that I thought it a *shame* that a strapping, able-bodied young fellow like him, should pass his time loafing, and spunging on the natives, and begging the price of a pair of boots from people who were going bare-foot themselves, when if he chose to turn his hand to any useful work he could earn the price of a pair in a day or two himself. The Saint departed without either praying or prophecying, at least aloud.

During the few years when they used to travel about this district I never saw one of them put his hand to work of any kind, nor did I ever hear of their attempting to teach their converts any kind of handicraft or manual labour of any description. They led, so far as I could judge, an intensely lazy life. They had some converts at Laie, where their head quarters in this district seemed to be, and I have frequently known them to make a day's journey, from thence to Waialee or Kannala, a distance of seven or eight miles. I have frequently seen those who had started from Laie in the morning, lie down to rest in a shady place and snooze out the day till the afternoon when they moved on into quarters for the night. They were perhaps during those hours, when to vulgar eyes and ears they appeared to be asleep and snoring, having visions or holding ungrammatical conversation with the celestial powers, as their manner is. The few converts whom they made about here were parties who were worth nothing either morally, intellectually, or pecuniarily. There were some scampish lads who joined them for fun for a while, some ladies who were living on a separate maintenance (finding themselves), who are termed in the vernacular, *Kumupaakai* (pillar of salt), and the leader was a man whom I have known since my residence here to have been a Roman

Catholic school teacher, a Protestant Missionary school teacher and a Mormon preacher. From his antecedents and general character, I do not think he added much to the importance of any sect. He has left this district. I never could see that the foreigners who came here teaching the doctrines had any other object in view than to lead an idle life themselves at the expense of their disciples, and so far as I can learn, it was some hints about the Church's tithes which checked the progress of the new religion here. The tenth row of kalo, the tenth pig, the tenth chicken, all taken by right divine too, would be a little too much for the most faithful Hawaiian believers.

It may be that I am narrow minded and prejudiced, but I have always classed professing Mormons under one of two heads, ever since I read and inquired anything about them, their history or their doctrines. I think they must be either dupes or knaves. If a man does *not* believe in Joe Smith, his dreams, his golden plates, and his conversations with the Diety, and yet preaches the doctrine, and endeavours to inculcate such a belief on the minds of men who are more ignorant than he is, I think that most people will allow, no matter what motives he alleges, that he is not playing an honest part. If he does believe in all these things, I for one have no great opinion of his intellect.

One thing more and I have done. I once happened to see a Mormon Elder robing and unrobing up at Kapena Falls. His inner garment was different from that of ordinary mortals. It was like a lady's peignor, of white material, open in front, reaching from his chin to his foot-fingers, frilled, with flowing skirts and ample sleeves. I looked on with admiration not unmingled with awe, and confidently expected that he would walk down Nuuanu Valley in his canonicals, and be followed by all the little boys. To my intense disappointment, however, he proceeded to clothe himself externally with such every day garments as common people wear. But how he ever managed to tuck into his pegtops the whole of the flowing drapery of his Ephod has always remained a puzzle and a mystery to me. I have always looked on it, as the process took place before my eyes, to have been an ingenious and complicated Mormon miracle, performed evidently by the laying on of hands. Apropos of miracles, as the Mormons claim to be able to do something in that line, I wish they would try their hand at a few showers, for we are dreadfully dry and bare just now, as dry and as bare as a Honolulu newspaper! If I were quite sure that they could manage the rain, I might be tempted to become a Mormon myself during the months of September, October, and November. I should protest, however, against the wives, the Ephods, and against believing in "et cetera," which I see is an article of their creed.

P.S.—Does "laying on of hands" mean seizing everything within their reach?

P.P.S.—(More last words) I see that they profess "healing." Is that the reason they use "the consecrated essence of" oil of gammon so extensively?

New Books.

The Sailor's Word Book. *By the late Admiral W. H. Smyth, K.S.F., D.C.L., etc. Blackie and Son, London, Glasgow, and Edinburgh.*

[We have already noted the appearance of the late Admiral Smyth's interesting and valuable work. Yet having received through his family the following further notice, this we also readily admit on the principle contained in the motto, "*Palmam qui meruit ferat*," and welcome to our pages the following lines from one of his old professional friends.—Ed.]

This work is a treasure snatched from the spoils of that inexorable spirit which is busy in casting aside those "wooden walls," and the old fashioned British tar, that were once the pride and glory of our land.

The nautical terms, phrases, and expressions, that were in vogue in Nelson's day, are here all recorded in the volume before us. They indeed seem like things of the past, for many of them, now no longer in use, are the very words of command which that great sea-captain used for working his ship in the storm; and for manœuvring his fleet in the day of battle.

The substitution of screws and propellers for sails; of iron-clads with teak backing, for planking upon ribs of oak; and of rifled guns and hollow shot for stands of grape and carronades, have done more than we are aware of, who are hurried along by the spirit of discovery, invention, and improvement in its resistless march of the day.

There are men and officers still living who participated in the battles of the Nile and of Trafalgar. Our author was of that school. Nay, it is but little more than two score years and ten since the Duke of Wellington was fighting his battles of the Peninsula War. Yet we may venture to say that neither that great Captain himself, nor any of the Admirals that co-operated with him by sea, if they could now rise from their honoured graves and visit your modern man-of-war, would know how to handle her, or be able to understand the orders given at her guns, or even from the quarter-deck. The whole:—the fashion of the ship, the size of the guns; the weight of shot; the means of "marching on the mountain wave;" the mode of steering, and the word of command, he would find almost all as new to him as if he had never before trodden the deck of a man-of-war.

When the Duke of Wellington was besieging Badajoz, he sent to Admiral (the late Lord) Berkeley, who then commanded the fleet off Lisbon, requesting the loan of a few "twenty-four pounders" for his siege train.

Answer came to the effect that the fleet did not possess a single piece of such heavy calibre. Now we arm steam launches of our line-of-battle-ships with guns as large as any that that gallant old Admiral had in his heaviest broadside batteries.

Still these were the ships, the guns and the men, that placed the sceptre of the seas in Britannia's hands, and won for the nation its ancient glory and renown.

In the "Sailor's Word Book," Admiral Smyth has preserved for us the sea terms and phrases then in vogue, and many of which are now as obsolete as the ships and the guns with which that glory was won.

Among the 15,000 nautical words and terms that this volume contains, those that are obsolete, cannot but be regarded by the British sailor somewhat in the light of hallowed memorials of the past. In turning over its leaves we meet here and there with a term or a sea-phrase, or a word that was a familiar expression of Nelson and Collingwood, and has often been "passed" along the decks of their ships; but which now is seldom or never heard at sea.

We must acknowledge a sort of veneration for a book which preserves such words for ever, and confess a feeling of respect for them, and cling to them with all the associations which they call up, as links in the chain connecting us with the master spirits of that era in our naval annals when they could shew big ships, small guns, and great victories.

Rating ships in the old fashioned way, and measuring them, not by tonnage and horse-power, as is now the custom, but as in days of yore, according to the number of guns that they carried, we are now in the era of BIG GUNS AND LITTLE SHIPS. But whether they are to win for us as many and as great victories as their predecessors did, remains to be seen.

Admiral Smyth was an officer of rare merit as well as varied accomplishments, and no one of his day has made more marks for good than he has. He was industrious; he was observant; his ear was always attentive and his eyes open. In youth he adopted the good old Scotch maxim of "mony mickle," and acted up to it so happily that he seems to have impressed every member of his family with the same spirit.

"*Little by little*" he was collecting words for his vocabulary—his Sailor's Word Book—during a period of more than thirty years. He left it at his death still with a few blanks to be filled, and a few "corners to be rounded off." But he left it in the affectionate care of a loving family and admiring friends, who fully appreciated the "muckle" that he had wrought with so much pains, and it is to them that we are indebted for the posthumus compilation of a book that is —essential—we had almost said—to the library of every one who follows the sea, or delights in its annals.

Though he had given to the world his Survey of the Mediterranean, his Bedford Catalogue; his admirable Essays which for twenty years enriched the pages of the United Service Journal, and shed light upon the most important professional questions of the day, and though he had done so much for the good of the Service and the State, he regarded the "Sailor's Word Book" as the best, the largest, and the most important work of his well-spent life.

To the Editor of the Nautical Magazine.

SIR,—In the French Sailing Directions, "Mer de Chine, IIIe. Partie," 1867, Captain Le Gras has given the Japanese names of the points of the compass. I have the pleasure of forwarding you a copy to add to the long list already published.

In the very interesting article "*Japan—Measures*,"—which appeared in last month's magazine,—there is an error it would be well to correct.

Under the heading "Cloth Measure," are given the following:—

10 Bu = 1 sung = very nearly 2½ inches.
10 Sung = 1 shaku = very nearly 1¼ feet.
10 Shaku = 1 djoo = very nearly 12½ yards.

These should read—

	Rin	=	0·015 inch.
10 Rin	= 1 bu	=	0·15 „
10 Bu	= 1 sung	=	1·5 „
10 Sung	= 1 shaku	=	15· inches or 1·25 feet.
10 Shaku	= 1 djoo	=	12·5 feet.

I am, Sir, your obedient servant,
ROBT. C. CARRINGTON, *Hyd. Off.*

Surbiton, S.W.,
February 18th, 1868.

ENGLISH.	JAPANESE.
North	Kita.
N. by E.	Kita soukochi higachi.
N.N.E.	Kita kita higachi.
N.E. by N. ..	Higachi kita soukochi kita.
N.E.	Higachi kita.
N.E. by E. ..	Higachi kita soukochi higachi.
E.N.E.	Higachi kita higachi.
E. by N.	Higachi soukochi kita.
East	Higachi.
E. by S.	Higachi soukochi minami.
E.S.E.	Higachi minami higachi.
S.E. by E. ..	Higachi minami soukochi higachi.
S.E.	Higachi minami.
S.E. by S. ..	Higachi minami soukochi minami.
S.S.E.	Minami minami higachi.
S. by E.	Minami soukochi higachi.
South	Minami.
S. by W.	Minami soukochi nichi.
S.S.W.	Minami minami nichi.
S.W. by S. ..	Nichi minami soukochi minami.
S.W.	Nichi minami.
S.W. by W. ..	Nichi minami soukochi nichi.

ENGLISH.		JAPANESE.
W.S.W. ..	..	Nichi minami nichi.
W. by S. ..	..	Nichi soukochi minami.
West ..	..	Nichi.
W. by N...	..	Nichi soukochi kita.
W.N.W. ..	..	Nichi kita nichi.
N.W. by W.	..	Nichi kita soukochi nichi.
N.W. ..	..	Nichi kita.
N.W. by N.	..	Nichi kita soukochi kita.
N.N.W. ..	..	Kita kita nichi.
N. by W...	..	Kita soukochi nichi.

PROTECTION OF IRON FROM FOULING AND CORROSION.

H.M. IRON TROOP SHIP "HIMALAYA" was docked at Devonport about the middle of December last, to examine her bottom after another lengthened course of active and useful service in removing troops with comfort and celerity, to and from various foreign stations since the early part of the past year, and was found to be *very clean* and entirely free from carbuncles and zoophytes, the "Peacock and Buchan's" Composition, with which she had been coated last January, being found very sound, smooth, and slippery like the back of a fish. She has just received another coat of this well tried and *economical* composition and is now lying in Plymouth South awaiting orders.

We understand that this fine steam ship still keeps up her reputation for speed, economy, and efficiency in every quarter of the globe, which has been maintained to the admiration of the world, ever since she became the property of the crown in 1858, having been built for the Peninsula and Oriental Company in London originally, and since which period she has probably done more *real work* than all the other old naval transports put together, and we believe, owing to her beautiful lines and admirable roomy accommodation, that notwithstanding her age (drafted by the late W. Waterman, and laid down in 1851), she will bear comparison with any one of the *new* crack iron troop ships recently constructed for the Indian service *via* Alexandria and Suez.

We have been informed that she can accommodate nearly if not quite as many troops with equal efficiency, and carry them with equal celerity, requiring a small quantity of fuel, and that her general expenditure of stores, wages, provisions, etc., etc., is much less. In this instance the government made a most advantageous bargain with the Peninsula and Oriental Company, as she cost a great many thousands of pounds less than either of the *new* naval Transports, and is as good in every respect as the first day purchased.

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 112.)

Name.	Place.	Position.	F. or R.	Ht. in Ft.	Dist seen Mls	Remarks, Bearings are by Compass.
3. Port Denison North Head	Queensland Australia	19° 59'·9 S. 148° 17'·7 E.	F.	86	11	Established 25th October, 1867. When seen bearing from S. by E. ½ E. to S. ½ W. it appears Red. See Note (*a*).
Port Curtis Gatcomb Head	Ditto	23° 53'·1 S. 151° 23'·7 E.	F.	66	10	Established 4th October, 1867, appears Red when seen W. by S. ½ S. to northward, and from N. ½ E. to N.N.E. ½ E. See Note (*b*).
4. Maryborough Woody island	Ditto	North Bluff	F.	130	...	Established 1st October, 1867. Between S.W. ¾ W. and W. ½ S. it is a Red light. See Note (*c*).
	Ditto	Middle Bluff	F.	215	...	Established 1st October, 1867. Between S.S.W. ½ W. and S. ½ E. it is Red, and between N.N.W ½ W. and N. by W. ¼ W. it is dark.
5. Bank off the Cape of Good Hope.	... ...	... ...	...	...	...	See Note (*d*).
6. Capri Island	Carena Pt.	40° 32'·1 N. 14° 11'·8 E.	R.	246	20	Established 10th December, 1867.
7. Tahiti I.	Point Venus	17° 29'·8 N. 149° 29'·3 W.	F.	...	15	Established 1st January, 1868. See Note (*e*).
8. Flatholm Usk river En.	Bristol Ch.	... ...	...	...	...	Established 3rd December, 1867, appears *Red* between S. ½ E. and S. W. See Note (*f*).
9. Grand Anquette	Jersey	Beacon	...	...	...	Washed away.
10. H.M.S. *Bombay*	Wreck	R. Plata	...	...	...	Position shifted. See Note (*g*).
11. Sombrero I.	West Ind.	... ...	R.	...	...	Established 1st January, 1868, once a minute. See Note (*h*).
Chefuncti R.	Louisiana	West side of Mouth	...	...	...	Re-established.
12. St. Valery	France N.C.	50° 11'·5 N. 1° 37'·5 E.	F.	25	8	Established 15th February, 1868. Red.
Aven R. En.	France W.C.	47° 48' N. 3° 44'·5 W.	F.	125	8	Established 1st March, 1868. See Note (*i*).
13. Rock off R. Plata	S. America	... ...	...	...	...	See Note (*k*).

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

(a) Directions.—From the northward, on opening the red light, the vessel will be in a line with the outer extremity of Cape Edgecumbe; having stood through the red light, and opened out the white light, steer in for the north entrance. While eastward of the red light she is clear of all the outlying dangers eastward of that cape.

(b) Directions.—From the southward while outside the East bank, in not less than 8 fathoms water, vessels should steer westward, until the light on Gatcombe head becomes red; while those from northward should pass into the area of the red light, and with this bearing S.W. by W. steer for it until East point bears N.W., then steer S.S.W. and open the white light before reaching Settlement point. When the line of change of colour is reached keep within the white light, which will lead in, clear of the rocks off Settlement point; after passing the point, alter course to pass outside the Oyster rock, and when the red light opens bearing N. $\frac{3}{4}$ E., being then to the westward of the Junction buoy, stand across into the South channel.

Bearings Magnetic. Variation at Port Denison 7° 30′, *and at Port Curtis* 8° 30′ *Easterly in* 1868.

(c) Both lighthouses are hexagonal, white, and 22 feet high; the Northern is placed four tenths of a mile from the extreme of Datum point, 100 yards within the high-water line: the Southern is on the summit of the island abreast Middle Bluff; they bear from each other S.E. $\frac{1}{2}$ E. and N.W. $\frac{1}{2}$ W., distant nearly 2 miles.

These lights are intended to enable vessels to enter the port of Maryborough through the West channel, at night.

Directions.—Entering Hervey bay, pass one or two miles west of the Fairway buoy, until the two lights on Woody island are seen in line bearing S.E. $\frac{1}{2}$ E.; steer with these lights in one past Dayman spit and the Middle bank, until they are nearly on the *same level*, then look out for the *red* buoy, a short distance S.W. of the line of the lights: on sighting it steer about E. $\frac{3}{4}$ S. (allowing for tide) for the red buoy off Woody island spit (or the north end of Long Middle bank): should the low or North light be the first to appear red, keep on the edge of the red light until the high light also is red; but if the high light is the first to appear red, steer south until the lower light is also red.

When the lights are seen as *red* at the same time, a vessel is about one third the distance from the spit across the channel;—then steer about S.E. $\frac{1}{4}$ E., and open the white lights. Now if the lower light shows *white* first, the vessel will be to the eastward of the course, and westward of it if the upper light becomes *white* first. From thence steer to pass Little Woody and Duck islands, keeping Little Woody island open of the latter until the high light is obscured, when the vessel will be abreast the *red* beacon. Then steer S.S.W. $\frac{1}{4}$ W. until the light again opens out as white, when she will be abreast the *red* buoy opposite the white cliffs, from which shape a course gradually for the river heads.

In entering with the two lights in one, should the red buoy which denotes the turning point, by any accident not be seen, the vessel may still safely stand on with the lights in one until the high light is dipped below the northern hill.

Bearings Magnetic. Variation 9° *Easterly in* 1868.

(d) With reference to Notice No. 48, respecting a rocky bank of 15 to 13½ fathoms, reported about 5 leagues to the S.W. of the Cape of Good

Hope, by the Spanish Merchant vessel *Justa*. The neighbourhood of the bank has lately been closely examined in H.M.S. *Peterel;* and as soundings in 200 fathoms are found at the assigned position, and depths of not less than 130 fathoms within a radius of 5 miles from it, the position of the shoal soundings made in the Spanish ship cannot be correct.

A well known bank, with a corresponding depth of water to that obtained by the *Justa*, is 7 miles from the Cape of Good Hope to the S.E. of the *Justa's* report.

(e) Directions.—The Artémise bank bears E. ⅝ S. from Venus point light, distant 9 miles. Coming from south or south-east, on opening the light, a vessel should not steer to the west of north until the light bears W.S.W., then alter course to west, passing northward of all the dangers and two miles from the reef off point Venus.

Bearings Magnetic. Variation 7° 40′ *Easterly in* 1868.

(f) With reference to Notice No. 85, see p. 47 and 48, the Trinity House, London, states that the Flatholm light has been coloured *red* from between the bearings S. ¼ E. and S.W., embracing the space between the West Cardiff buoy and the Monkstone beacon, and leaving a fair berth outside them respectively.

The alteration in Usk Light.—Also, with reference to the same Notice, the lighthouse at the entrance to the Usk river now shows but one light, a *white* light from between the bearings N. by W. ½ W. and N.N.W. ½ W. to mark the channel into the river; from which bearings respectively a *red* light is shown to the eastward to the bearing W. by S. ½ S. and to the south-westward to the bearing N.N.E. on which bearing N.N.E. it will cut the S. W. Patch buoy. From N.N.E. a *white* light extends to the land, ending on a bearing of N.E. by E. ¾ E.

A *white* strip, or streak of white light is visible up the river from between the bearings S.W. by W. ¼ W. and W. by S. ½ S.

Bearings Magnetic. Variation 22° *Westerly in* 1868.

(g) The remains of H.M.S. *Bombay,* burnt in 1865, have shifted; the following bearings are given for their present position:—Montevideo Church N.W. by W. ¾ W. Flores island N. ¼ E. Light vessel on the English bank S.E. ¾ E. distant 4 miles.

It is further reported, that the fishermen of the locality fasten their boats at low water to the bowspit of the wreck, which is then awash.

Bearings Magnetic. Variation 9° *Easterly in* 1868.

(h) With reference to Notice to Mariners No. 64 (see p. 636 of Vol. for 1867), stating that a lighthouse was then in the course of erection on Sombrero island, the northernmost of the Lesser Antilles, from which a revolving light attaining its greatest brilliancy *every minute*, would be exhibited in January, 1868.

The light has been exhibited from the 1st day of January, 1868.

(i) The light appears *white* from Isle Verte on the west to Les Verres rocks; *red* on an arc exactly covering the plateau of rocks Les Verres and Le Cochon, and *green* on approaching the coast to the eastward.

Directions.—By keeping the white light in sight, a vessel will keep clear of all dangers.

(k) A sunken rock has been found off Farallon island, near Colonia,

North shore of the Rio de la Plata, not noted in the charts. It has 15 feet water over it at a mean state of the river when low, and from 18 to 21 feet around it. The bearings are:—Farallon island, North end E. by N. Hornos island, West end N. ¼ E.

Bearings Magnetic. Variation 11° *Easterly in* 1868.

NAUTICAL NOTICES OF JAPAN.—*By Commodore Goldsborough, U. S. N.*

WEST COAST OF NIPON.—*Tsuruga Bay, lat.* 35° 39′ *N., long.* 136° 4′ *E.*—Approaching Tsuruga bay from northward, steer so as to be six miles from the north end of Tamagawa when it is in line with Ibo point; then steer S.E. ½ S. until a triangular white cliff (left of the town) is opened, and when it bears S. ½ E., steer for it until the first prominent point on the left of the bay, going in, bears E. by N. ¾ N.; then steer S. ½ W. to the anchorage.

Anchor in the bay about one-third of a mile from the shore, in 9 fathoms water, blue mud, shelving bottom, good holding ground.

It is very easy to take or leave, and is without any known rock; no soundings under 13 fathoms until well in the harbour; scattering rocks may be on the western shore, to be avoided. We passed mid-channel, the point of land (the western entrance of the bay) and another on the east side to the northward nearly overlapped each other from our berth.

From our anchorage the bay seemed land-locked, it is said that during autumn and winter a heavy swell sets in when the wind is from northward. The land around is high; with villages on the eastern side of the bay.

The town of Tsuruga is at the head of the bay, with its 15,000 inhabitants; exporting dried fish and rice. Good lime is made in the neighbourhood of Tsuruga.

Rise and fall of tide, 2 feet.

Mikuni Roads, lat. 36° 12′ *N., long.* 136° 8′ *E.*—The approach to Mikuni roads is bold to half a mile from the shore, where soundings vary from 9 to 6 fathoms.

The best anchorage is found by bringing the west end of Assinia island north; then bring the mouth of Mikuni river to bear E.S.E., when 7 fathoms will be found; bottom sand and hard mud; good holding ground. The course can be laid E.S.E., for the entrance, and the soundings being gradual, a suitable depth may be found for anchorage.

The west side of Assinia islands is bold. The *Shenandoah* passed within three-quarters of a mile of it, anchoring in 6 fathoms water; sand and hard, black, muddy bottom. The bar to the river Ekada three-quarters of a mile off.

The town of Mikuni is on the right bank of the river, about half a mile from its mouth; the bar has only 6 feet at low water. Rise and fall of tide about 9 feet.

The anchorage in the outer roads is open from S.W. round west to north, but sheltered from all other winds. Rocks are reported inside of the island northward of the anchorage; give this island a berth of about half a mile, and haul up for the entrance of the river when it bears E.S.E.

The town of Mikuni is said to contain about 10,000 inhabitants, their exports silk and dried fish.

Anchor with the centre of the island bearing north.

Myadsu is in lat. 35° 32′ *N., long.* 135° 15′ *E.*—As the southernmost of the Okino islands bears N.E. ¾ E., about 8 miles, from the entrance to Myadsu.

With this island on that bearing, steer S.W. ¾ W. between Whale point and Okatashima; then S.W. ¾ S. for the mouth of the harbour, then run direct for the battery. The depths from the mouth of the harbour will gradually decrease from 11 to 7 and 6 fathoms to abreast of the town, bottom mud. The best anchorage is on a north line from the battery in about 8 fathoms, the harbour excellent.

At the right of the town, and off a red sand-bank about 150 yards, a sounding of one fathom was found. Outside a line from this spot to the battery, are depths of 5 fathoms to within three ships' lengths from the shore anywhere in the harbour; within this line soundings are shallow.

The harbour is easy to take or leave, and free from dangers; shoalest water is on the western shore; on the eastern side of the entrance between the two inner points beware of a rock.

Keep mid-channel and you will carry good water up to the anchorage.

The land seen from sea is high and uniform. The Okino islands are the best landmark; but no vessels should pass between them.

The town contains about 12,000 inhabitants. A mart for silk and dried fish. A four-gun battery stands in front of the Daimio's residence, the guns old and worthless.

A spit of 9 feet makes out about one-third of a mile from a yellowish bank in the western angle of the harbour.

Rise and fall of the tide barely perceptible.

Nanow (*or Nanao*), *lat.* 37° 2′ *N., long.* 136° 58′ *E.*—Nanao has two entrances, formed by an island about 3 miles long, parallel with the coast between the northern and southern extreme points of land which form the entrance to this spacious bay.

There are no peculiar features of the coast, or landmarks, to denote the entrances when approached from the sea. They may, however, be readily seen by the open space, which is easily discernible from almost any position. The coast for two miles off appears clear and free from rocks, so far as known. A sunken rock is found about 5 miles from the southern point, and there is a reef off the northern point of south entrance.

The soundings decrease gradually from 54 fathoms, 20 miles off, until the land is neared. The best course for either entrance is mid-channel.

The northern entrance is said to be more free from obstructions than

the southern; for, off the point of land in the latter, shoals are known, which by keeping in mid-channel, and attending to the lead, may be avoided.

The entrance to this harbour is about half a mile wide; but after passing the projecting point which forms the narrow entrance, a wide and capacious bay opens.

Bring the middle of the southern entrance to bear W. by S. $\frac{3}{4}$ S., and run for it. When in the channel, keep close over to the north shore, running parallel to a line through North Channel Bluff and Matui-Osaki, which will be about a W. by S. $\frac{3}{4}$ S. course; keep well outside the bight between the two points, to avoid a shoal of 3 feet bearing S. by W. from a little village. In passing through the channel south of North Channel Bluff, borrow on the northern side, as it may be approached closely, and steer in towards the harbour S.W. by W. $\frac{3}{4}$ W. All bearings are magnetic.

The southern side of the entrance of Nanao is said to be rocky, with dangerous reefs extending in an easterly direction 5 miles from it.

From North Channel Bluff steer S.W. by W. $\frac{1}{4}$ W., by compass, until north side of square cliff (Ota) is in line with east end of Mejima; then steer S.W. $\frac{3}{4}$ W. until north end of square cliff is in line with centre of Ojima, then steer S. $\frac{1}{4}$ E. until centre of square cliff bears E. $\frac{1}{2}$ N., where a good anchorage will be found in $4\frac{1}{2}$ fathoms water, in about the middle of the harbour.

The danger to be avoided in entering this harbour is a shoal of 16 feet, about a cable from Ojima, and in range with that island and the north end of square cliff.

The city of Nanao stands in the extreme western angle of the bay. Depths gradually decrease from 14 fathoms at the entrance to the anchorage off the town.

Two small islands, 10 feet above water, are about $2\frac{1}{2}$ miles off from the town; good water all round them, except about a cable and a quarter W.N.W. off the western one, where there is a patch of 16 feet. By keeping to starboard, on entering and passing about a quarter of a mile from the only bluff point on the western side 7, 6, 5, and 4 fathoms water, muddy bottom will be carried.

The population of Nanao is about 15,000. There is a ship-yard forming to the eastward of the town.

Niegata.—Latitude 37° 57′ *N.; Longitude* 139° 0′ *E.*—Anchorage off the city of Niegata is in 10 fathoms water; mud and fine black sandy bottom, the soundings decrease gradually to the shore. Twelve feet of water was found on the bar, high water; rise and fall 4 feet.

The bar has two boat channels; that to the east is deepest. About half a mile from the land is a sandbank about one mile wide; but inside the bar there are four fathoms. The coast is low presenting an even appearance, dotted with trees and houses.

A strong in-draught on the flood tide is experienced to 4 miles off the entrance of Niegata; on the ebb it sets in the contrary direction.

During the autumn and winter months no vessel but a powerful steamer, could anchor off this port, as gales of wind, commencing at S.W. and veering to N.W., rapidly succeed each other, raising so much sea that no ground tackle could be depended on, and the holding ground is very indifferent.

The city of Niegata, one of the richest on the west coast of Niphon, stands on the left bank of the Sinanogawa river. It contains 35,000 inhabitants, and appears to absorb the whole junk trade of that side of the island.

NOTES OF NOVELTIES.

AMONG the "varieties" which we collect in our "Novelty Papers," first must be placed the narrative of the very narrow escape of destruction by fire experienced by H.M.S. *Basilisk* in the Japan Seas. It was the cool determination of most vigorous efforts of good discipline, readiness for duty under the management of an able commander, that saved the ship from destruction, as recorded in the following extract.

The *Japan Times* of December 14th says:—"Yesterday morning, when the *Basilisk*, which had left Yokohama for the Inland Sea on the previous day, was about forty leagues on her way, an alarm was given of 'Fire!' One of the servants had occasion to get something from one of the store-rooms under the wardroom, and managed to upset a carboy of turpentine, which immediately ignited from the lamp, and in an instant the flames shot forth, spreading with inconceivable rapidity. The alarm having been given, the crew were immediately called to fire-quarters, and no less than five pumps—two steam and three hand—were brought to bear, but without the slightest effect for some time. Everything was done as coolly as if they were merely at exercise; but all seemed for a long time hopeless. The boats were all prepared for lowering, and every preparation was made for abandoning the ship, as the fire appeared to be unmanageable. The lower-deck was scuttled in several places, to allow the hose to be brought to bear. As the fire was now threatening the magazine, steps were taken with the view of sinking the ship, as Captain Hewitt preferred taking the chances of the boats to that of being blown up. Three to four feet of water was already in the hold before signs began to show of any mastery being obtained over the flames; but at length they succumbed, and the exertions of all were rewarded by seeing the ship out of the great peril that had threatened her. Most of the stores, the ship's papers, log, officers' stores, etc., were destroyed, and the ship was obliged to return to port, which she entered at 1.30 this morning. We have been very minute in our inquiries, and are pleased to give expression to the remark of one on board—that in the midst of the danger he couldn't

help admiring equally the coolness of Capt. Hewett, his officers, and men. The former was always just where he was wanted, the officers conveying and the men executing the orders in all respects as if at ordinary fire-quarters, the sole exception being the increased speed of the revolutions of the pumps. The hull of the ship, although much damaged, is not so much as to be beyond comparatively easy repair; and we congratulate the captain, officers, and crew, on bringing their ship safely into port. From her first arrival in Yokohama she has always been extolled for the splendid order in which she was, and the behaviour of all on this trying occasion, shows how truly her discipline was commended."

Thus by a prompt, and we may add by well directed and energetic perseverance, the services of a noble ship of above a thousand tons were saved to the navy.

The launch of such a ship of war as the *Hercules* is an event which must not be neglected from our list, but instead of launch it should be termed her successful sally from the building dock that took place in the early part of the month at Chatham, and is thus related in the papers of the day:—

She was laid down in June, 1866, when she occupied the dock which the *Bellerophon* had then just vacated. The *Bellerophon* and *Lord Warden* having been completed, two new ships of war were at once commenced—the *Hercules* and the *Monarch*. The *Hercules* was to be constructed upon the broadside principle, while the *Monarch* was intended to be a specimen of a turret-ship. At that time controversy as to the respective claims of turret and broadside ships was fierce, and the Admiralty, jealous apparently of out-door interference and advice, compromised by ordering two new ships to be built to represent these systems, both being of about the same tonnage and horse-power. The *Monarch* is not yet complete; the broadside specimen, therefore, in the shape of the *Hercules*, has the advantage of being first in the field, or, as one ought to say, in the water.

At present, then, the *Hercules* is the most powerful iron-clad afloat in the British navy. It is doubtful even if there is any ship afloat in any navy which, in point of strength and armament can compete with her. Her tonnage is 5,226 tons, and 1,200-horse power. She is plated with solid iron nine inches thick, which weighs 1,250 tons. With this weight of armour she was launched. Her armament, engines, and fittings are not, of course, on board yet, but with these exceptions it is in a very forward and complete state. That a ship of this tonnage should be built at all, capable of bearing so much armour, is wonderful; like the *Bellerophon* she is broader and shorter than ships whose lines are constructed on orthodox models. Not only does she bear an enormous weight of armour plating, but her decks and supports are all covered with iron. Indeed the main deck is coated with steel as a precaution against shells finding their way into the lower decks. Her armament will consist of eight 18-ton guns, two 12-ton guns, or 300-pounders on the main deck, and four 6½-ton guns on the upper deck.

This is not a large armament; but in our modern navy size has ceased to be the test of power. What is wanting in numbers is made up in the mechanical appliances for making each gun do double duty. They are so arranged as to be used in a broadside or fore and aft without any difficulty. The machinery which is adopted for this purpose has been fitted to the *Hercules* from designs by Captain Scott, whose scientific knowledge in regard to ships' armaments is well known.

Upon entering the *Hercules*, the first resting-place was the central battery, which will contain her ponderous armament. It is iron-proof, and communicates with the fore and after parts of the vessel by means of solid iron doors. Although this battery is in the centre of the vessel and constructed on the broadside principle, with portholes cut in the ship's sides in the ordinary way, the sides are indented in such a way as to allow of four of the guns (two on each side) being trained so as to fire fore and aft. Mounting on to the upper deck there was nothing to see but a bare surface of deck enclosed by low bulwarks. Considering that the *Hercules* is now one of our first-rates, a stranger could not fail to be struck with her apparently small breadth. It did not seem possible that such a vessel, which had more the appearance of a large barge than anything else, could carry the enormous weight of 1,500 tons of iron; or that carrying it she could possibly float. On this point there was no small amount of anxiety—shipwrights and officers were equally nervous as the time of high tide approached. At a quarter past one, however, all fear was dispelled by the information, which spread through the crowds, surrounding the ship, that she floated. With no more, therefore, than fifteen feet of water at her bow, and twenty at her stern, this enormous weight was afloat.

From this time, then, till a quarter to two, all eyes were turned towards the entrance of the stand where the First Lord and the official party who had come from town to witness the launch were expected to make their appearance. At five minutes to two after the usual amount of hesitation and preliminary education in the art of throwing the bottle, Miss Corry cast it from her, and it fell, as it should, against the ship's bow, and was dashed into atoms by the fall. A small rope alone held the vessel to the dock; with a mallet and chisel Miss Corry severed this slight tie, and in an instant, amidst the acclamations of the spectators, she left slowly, but steadily and buoyantly, for the river. In a few minutes she was buoyed safely, and now only waits for her engines and fittings before she is ready for sea. The *Hercules* is a noble addition to our fleet; and it is to be hoped that its power will never have to be tested otherwise than morally.

The *Hercules* is no doubt a noble ship and no doubt naval officers are divided in opinion on the subject of turret ships which really form the main body of the American navy. We long ago said that we looked on them as the *bull dogs of our iron bulwarks*, the animals which after all will do the heavy work and soon send some of our ironclads to the bottom. The *Times* in a recent number has said something on this subject well worthy of attention, that we may here transcribe.

Can we not learn a lesson from the sister service? They encounter

modern artillery, not by massing their troops in denser columns, but by opening them out in skirmishing order, every two soldiers acting at a distance from their neighbours, creeping if need be along the ground, and taking advantage of every rock and bush to diminish the target for the enemy's guns. Why do we obstinately refuse to build small ironclad single-turret vessels, with low freeboard, and one or two guns of the heaviest calibre, multiplying the number of these gun-carriages as the demands of our fighting navy and the extent of our coasts and colonies require? The Controller of the Navy tells us that for coast defence these small vessels have not a single defect; they can carry and work guns which are beyond the capacity of the *Bellerophon* or the *Hercules*, and the smallness of their size makes them far more difficult to hit, and yet we have not a single specimen built or building. But for ocean purposes we must, he asserts, elevate our gun above twelve feet, which is the average height of the Atlantic wave, and this single condition at once changes all the elements of the calculation, necessitating high freeboard, large dimensions, heavy vertical armour, and all that tends to cause a ship to roll. We demur, with deference, to this theory. Why should the gun be always higher than the crest of the wave? A freeboard of two feet, with the deck sloping up to six feet, would enable the captain of the gun who looks out from the top of the turret to keep the enemy in view, and fire when all was ready as his ship rose on the wave.

All seagoing experience is in favour of small turret ships with moderate armour-plating.* The American and Russian officers who have actually tried them report with enthusiasm of their seagoing properties. The *Miantonomoh* has rounded Cape Horn; both have fallen in with every extremity of weather, yet, while the wooden broadside ships which were sent to nurse them rolled more than 20 degrees, the turret ships sat like ducks upon the water, and never rolled more than 7 degrees. In a gale off Point Conception, on the coast of California, which lasted fifty hours, the *Monadnock* twice parted her tiller ropes, and quietly hove-to with her double screw propellers, lying dry and comfortably in the storm. Compare this with the short-lived cruise of the *Vixen* above described. It remains to be seen if the *Captain* and *Monarch*, the colossal turret ships which are now under construction, will prove successful. If they fail, it will be due to the height of freeboard which the Admiralty have required.

Turning from turret ships to Christmas doings, the new world have been reminded of the old times known in England, by the extraordinary pranks of a ship of war, which are too formidable for imitation in the Royal Navy, as they seem to have been carried on in H.M.S. *Galatea*. We preserve the following extract, which far transcends any such doings within our recollection, not even when Neptune welcomes us to *cross the line*. We read in the *Melbourne Argus* of December 27th :—

* What we do want is a good sprinkling of these small craft, such too as the American ship *Japan*, as she appeared in our last Number's Novelties page 111.

"CHRISTMAS SPORTS ON BOARD HER MAJESTY'S SHIP GALATEA.—Christmas-day in port on board a frigate like the *Galatea*, where there is a compliment of well nigh 500 men, so many thousand miles away from that "tight little island" where Christmas is an institution interwoven with the national life, is "the" day of all days of the year, and by no means to be observed lightly, or celebrated with indifference. The most amusing portion by far, however, of the day's entertainment was undoubtedly the chairing of the officers. After dinner the men, as a matter of course, were in a state of high good humour and hilarity, and officer after officer, from the commander down to the tiniest "middy," was seized, placed on a chair lashed with two handspikes, and duly hoisted and carried round the decks in triumph. The ludicrous procession was accompanied with vocal and instrumental music, distinguished more by strength of sound than harmony of execution, the chief burthen of which was a repeated and prolonged outburst of "He's a jolly good fellow," sung to the usual popular tune, and followed, as the delighted occupant of the chair was shot out at his cabin, with three times three rattling British cheers. This privilege of chairing the officers is highly prized by the men, and is only liable to objection when the head of the chaired may happen—accidentally, of course—during the course of his ovation, to come in contact with some hard unyielding beam or wretched lamp which was hung scarcely high enough. This fun lasted until well on in the afternoon, and when the list of officers had been exhausted, the petty officers were also treated to a taste of the triumphal entertainment, but with much less delicacy of handling; and when the spree had well nigh run its course, the dogs belonging to various parties on board were decorated with ribbons, and underwent the chairing process in a state of blank bewilderment, and with countenances on which the most comic consternation was expressed. After tea, singing and dancing were resumed, and set-dances, circle-dances, and step-dances were carried on simultaneously, with unflagging zest and vigour. One great feature in the carrying out of the day's amusement is, that the boys on board are for the day promoted to the rank of men and petty officers, and these in turn take the place of the boys. Great scope is thus afforded to the youngsters to have some playful retaliation. The proceedings throughout the day were marked by the purest fun and good-humoured practical joking, such as only the British sailor mind could conceive, and, having devised, carry out with telling effect. To those who were privileged to be present, Christmas-day on board the *Galatea* will not soon be forgotten.

It is proposed to erect a tower on the summit of Mount Lofty to commemorate the visit of Prince Alfred to the colony of South Australia. An influential committee have been appointed, and the Government have granted a site. A scheme has also been started to erect a Sailors' Home at Port Adelaide to commemorate the same event.

We must conclude by saying, we are glad to perceive that the

Committee of the Life-boat Institution in the Adelphi continue their valuable labours with success. A report of their's says:—

During the past year the lifeboats of the institution have saved the lives of seven hundred and eighty-five persons, in addition to thirty-five vessels rescued from destruction. The institution has also granted rewards for saving three hundred and three persons from various wrecks by shore boats, and other means, so that the society has contributed altogether during the past year to the rescue of one thousand and eighty-eight lives from different shipwrecks.

And it appears by the report of February that many rewards were also granted to the crews of shore boats for saving life from wrecks on our coasts, and payments, amounting to £2,930, were ordered to be made on various lifeboat establishments, and it was reported that during the past year the institution had expended £31,845 in forming new life-boat stations, and in maintaining other lifeboats in a state of efficiency.

While our ships have no harbours of refuge to run to on our coasts such assistance is most benevolent.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, *in February*, 1868.—*Sold by J. D. Potter*, 31, *Poultry, and* 11, *King Street, Tower Hill, London.*

296. DEm = 0·4 Newfoundland, Bonavista Cape to Bulls Bay, including Trinity and Conception Bays, Capt. Orlebar and Staff-Commander Kerr, R.N. 1867. 2s. 6d.

825. DEm = 0·13 Bengal Bay, Andaman Islands, corrected by Commander Brooker, R.N. 1867. 2s. 6d.

2660. DEm = 0·05
2660a DEm = 0·05 } China Sea, Southern portion, 2 sheets. 1867. 5s.

1057. $\frac{DE}{2}$m = 1·0 Australia, North Coast, Liverpool River Entrance, Messrs. Howard and Guy, Navigating Lieutenants, R.N. 1866. 1s.

1948. $\frac{DE}{2}$m = 1·0 Australia, North East, Rockingham Bay to Palm Islands, corrected to 1867. 1s. 6d.

EDWARD DUNSTERVILLE, *Commander, R.N.*
Hydrographic Office, Admiralty, 20th February, 1868.

To CORRESPONDENTS.

The "WAVE QUEEN and her disappointments," in our next.

Want of space also obliges us to defer the SOURABAYA, and CAPTAIN PERRY'S papers, besides several articles from among our Novelty Papers.

Our friend Captain Perry's Paper came too late for this: will be in our next.

CAPTAIN HECKFORD, on Collisions, we shall always be glad to hear from.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

APRIL, 1868.

Voyage of H.C.M.S. Narvaez

From Manila to China and Japan in 1864.*

On the 23rd of April at 7.30 a m. we left Manila bay with the Spanish legation † for China. Considering that the route by the Pacific would be shorter and less stormy than that by the Formosa channel, it was adopted, and we passed the islands of Meia Cosima. To the East of Formosa we met fine weather, with winds from S.E. and S.W., and also in the Kuro Siwo or Pacific gulf stream. On the 30th we made the northern islands of the Chusan group, and anchored for the night off the bar of the Yangtse-Kiang.

On the following day we entered this river, and after anchoring several times on our way for tide at the entrance of the river Woosung, or on account of fog, we arrived at Shanghae at seven a m., of 2nd May. The passage therefore occupied nine days all but half-an-hour; in which time the ship was delayed at anchor one day and nine hours. Our rate of steaming was six and a half knots, assisted by sail when available. At Shanghae we completed coal, receiving one hundred and ten tons.

The purchase of this fuel, that at first seemed simple enough, there being abundance at the place, was attended with such serious difficulty that it became a question with us whether we should return here for more when it was required. There are large deposits of coal at

* As the accounts of the visits of our officers to foreign ports appear to be scarce, we gladly avail ourselves of those of foreign vessels of war, among which we find some interesting information in the report of the Spanish ship of war, *Narvaez*, to Her Government.

† The officers of the legation consisted of His Excellency Senor Don S. de Mas, Don Jose de Aguilar, Consul at Hong Kong, Secretary Don P. A. de Toledo, and various other persons.

Shanghae, but they belong to different steam companies, in store for their own vessels; and it was no easy matter to find out who would supply our wants. Bad coal is plentiful and easy to be had, although dear enough, but the good coal is not only scarce but difficult to be got at any price. At length, however, we did find some of tolerable quality at sixteen dollars the ton, and by the evening of the 12th we were again ready for sea.

The town of Shanghae stands on the left bank of the Woosung river, and is composed of three distinct parts, each of which has its own peculiar character. There is first the Chinese division proper, with its miserably narrow streets, its characteristic want of cleanliness, its infinity of shops, its brick walls, quadrangular towers, and its ditch, serving the purpose of a canal. Between the city and the river is the suburb of Tonka-duj, a kind of human oven, with its winding alleys of still smaller breadth and abundance of filth, within the walls of which suburb there exists an enormous population; half of it living on the water in vessels formed in all kinds of ways, and the other half in those huts like toys that may be seen in all parts of China. Outside the walls and along the river are the French, English, and American concessions, well apart from each other; being separated by canals, which are navigable for small craft, and which are spanned by wooden bridges.

These concessions mean a certain area of ground, the possession of which is guaranteed by the Chinese government to the representatives of the western nations. They are occupied generally speaking by Europeans, the number of which in Shanghae is tolerably large. In fact in the interval of ten or twelve years a town has sprung up, which is already about as large as Manila, where the consulates, as well as the houses of the principal merchants stand, and which houses indeed may more properly be styled sumptuous palaces.

In this town is to be found French, English, and American territory (surrounded by that of the Celestial Empire), all under their several jurisdictions, and absolutely independent of all Chinese authority. Each of these countries has introduced into its portion of ground (the possession of which has been conceded to them) their several institutions and character; so that it may truly be said that the Shanghae concessions are literally pieces of France, England, and the United States, transported over the seas and deposited on the soil of China. In each of them is found the mode of living of the nation to which it belongs. Thus it is only necessary to cross a bridge to get into a foreign country; and by merely crossing another, the voyage from Europe to China may be considered as having been made. On one side are seen walls of monuments, where formidable buildings stand, contrasting strangely with the decrepid edifices of the east; there are wide roads bordered by trees, hotels, luxurious bazaars, first rate shops, carriages of all kinds, passengers, and even the English policeman, or the French gendarme. On the other side narrow dirty lanes meet the eye, dark and humid edifices full of sickly looking people; so numerous that they can scarcely move. Then there are sedan chairs

hermetically closed, borne on men's shoulders who are calling lustily to make way for them; shops painted of all colours containing things innumerable and indescribable, the purpose of many of them difficult to discover. Here and there pagodas, the doors of which are painted with figures of fantastical monsters, in the most brilliant of colours, and of forms the most inconceivable. Again there are some Chinese soldiers bearing on their clothes large ominous characters, especially on the breast and over the shoulders, with the word "valiant," as a kind of certificate to set aside all doubt regarding the wearer on that subject. And lastly, in lanes the most frequented by passengers is displayed the disgusting spectacle of various human heads, enclosed in cages and suspended high in the air at the end of a long pole, the said heads with faces frowning down on the multitude continually passing and repassing beneath them, as a perpetual warning from the Chinese governors against the unhappy and degraded inhabitants of Shanghae.

The importance which this place has attained in the short time that it has been open to European commerce, is so great as to surpass all calculation. The Chinese craft, the largest of which are about the size of brigantines, lashed alongside of each other in close strings of sixteen and eighteen abreast, occupy an extent of three miles along the river before the city walls and the warehouses of Ton-ka-du. Happening to pass along the river in my boat one day, I have counted more than four thousand vessels of three and four masts, so well arranged and moored in their proper places, that they do much credit to the mandarin who has the regulation and management of vessels in the port of Woosung. Abreast of the concessions the European ships which frequent the port are anchored, and of these at present there are thirty-five steamers, and eighty-three sailing vessels at Shanghae. Lastly, the annexed memorandum of the returns of 1862 and 1863 will shew numerically the trade of the port of Shanghae, the emporium of Chinese commerce in the present day with Europe and America.

On the first day when passing Woosung, a town seated at the mouth of the river of this name, about fifteen miles from Shanghae, I found there a French squadron of ships commanded by Admiral Juarez, which had sailed a few days previously for the Gulf of Pechili. At Shanghae there was also another English squadron under the command of Capt. Leckie. The first was composed of the screw frigate *Semiramis*, the transport *Dordogne*, and the gunboat *Kien Chan*; and the second by the *Leopard* steamer, the screw corvettes *Coquette* and *Swallow*, the gunboats *Cockchafer*, *Dove*, *Hardy*, *and Starling*, and the *Acorn* boat. There were besides at Shanghae a Chinese screw steamer with one gun, and lorchas of the same country, carrying some kind of artillery.

The *Narvaez* is the first Spanish ship of war that has been seen in the northern China seas. From the time of our arrival at Shanghae we have been (both the officers as well as myself) treated with marked attention on the part of Europeans in general, and more especially by Captain Leckie, chief of the English Naval forces. It is not necessary to say such attention was received on our part with a corresponding acknowledgment.

As soon as we arrived at Shanghae our minister landed, the legation remaining on board. In spite of the advanced state of the season, the cold was severe and the weather very bad. From our arrival at Shanghae it has been nearly always raining, and Fahrenheit thermometer varied between sixty-two and forty-three degrees. The first thing to be done was to dress the crew in winter clothing, and unfortunately, from a long sojourn within the tropics, we were all of us badly off for winter garb. The crew suffered at first very much from the sudden change of temperature, but it soon passed off. The sharp air of these latitudes, that reminded us of our own winters, has been beneficial in compensating for the enervating climate of the Phillippine Islands, and in reality the health of the crew was much improved by it.

TABLE SHEWING THE AMOUNT OF COMMERCE AT SHANGHAE.

Years.	Total value of		Dues received by the Chinese Government	Tonnage of Vessels		Exportation of	
	Imports	Exports		Arrivals	Departure.	Silk	Tea.
	Pounds Sterling	Pounds Sterling	Taels *	Tons	Tons	Picos †	Pounds
1862	22,863,953	14,667,406	4,172,019	724,138	723,279	63,300	59,744,408
1863	29,709,575	12,227,153	2,526,631	964,309	996,890	33,436	69,026,952
Difference	+ 6,845,622	—2,440,253	—1,645,398	+ 240,171	+ 273,611	— 29,864	+ 9,282,544

* The Tael is valued at about 1·32 dollars.

† The Pico contains 133 pounds nearly.

SHANGHAE, 18th May, 1864. *Extract from Commercial Documents just published.*

On the 16th May, at daylight, we sailed from Shanghae for the gulf of Pechili. In the course of that day we had descended the Woosung river and the Yangtse-kiang, and by the evening were outside the bar of the latter, making our way to the northward for the Yellow Sea. On our passage we had mostly calms and light weather. On the 18th, in the evening, we sighted the Shantung peninsula, and in the course of the night rounded it to the northward. On the following day we ran through the Miau-tau islands, and passing in sight of the Sha-lui-tien rocks anchored off the bar of the Pei-ho river in the afternoon of the 20th.

We found here the French frigate *Semiramis*, which had left Woosung a week before we left Shanghae. She was the only vessel at the anchorage, and was awaiting the return of Admiral Juarez from Tientsin. There were however three or four small merchant craft inside the river.

Since the late Chinese war the French and English occupy the forts at the entrance of the Pei-ho; that on the left bank being garrisoned by the French, and that on the right by the English. They have also some small detachments under the command of naval officers. One screw gunboat stationed at Tientsin, and a French schooner (not a steamer), anchored near the forts, serve to keep open the entrance of the river to their ambassadors at Pekin, and the mouth of the Pei-ho, by which they communicate with the exterior. At the same time they contribute to consolidate the good relations of these countries with China, they remind the mandarins of the Celestial Empire the no very distant visit which the European fleets paid them. The forts at the entrance of the Pei-ho, if I am not mistaken, were to be evacuated by those persons; but in consequence of some complication which seems to have occurred to the Chinese government, they are not only not yet evacuated, but the French Admiral reinforced his garrison with some of the crew of the *Semiramis* during my stay.

We soon found that the *Narvaez* drew too much water to cross the bar of the Pei-ho, and we realized the reports about it that we had heard at Manila. The Pei-ho in fact is only navigable by vessels drawing very little water. As our minister considered that he could only land at Tientsin from a ship of war, a communication was opened with the French Admiral who placed the *Kien-shan* gunboat at his service; a small paddle wheel steamer attached to the *Semiramis*, which vessel we found lying here. The Spanish minister proceeded to Tientsin in the *Kien-chan*, under the usual salutes.

The anchorage off the Pei-ho is about as bad as any in the world; compared with it, indeed, that of Sacrificios, off Vera Cruz, is much the better of the two, being commodious, sheltered, and safe. At the Pei-ho the anchor is dropped off the shore as may be convenient without shelter from any wind, with a heavy sea, a very low shore, the weather in the gulf never settled and fine, the distance from the shore enormous, and the passage to it most unfit for boats.

When we arrived, we anchored as near the shore as possible, with the view of facilitating the landing of the legation, as it appeared to

be very difficult; so that we were lying in four fathoms, and yet the shore was seven miles off; the French frigate, our only companion at the anchorage, being four miles outside of us. During the night the tide ebbing, as we had accidently anchored at high water, the *Narvaez* was left with just sufficient water to float her, when it was calm. Therefore with a view to better our berth, the steam was got up and the ship was moved further out towards the *Semiramis*, to ten miles off the Pei-ho. The frigate however, notwithstanding she was eleven or twelve miles from it, also shifted her berth further out to fifteen miles from the forts before she could find sufficient depth for her draft in the sea that was occasionally running. A boat that landed the day after we arrived, was four hours on her return to the ship. And even considering the time occupied by small boats which had to communicate with the forts, and also considering the tide for facilitating their passages, no boat could ever be depended on to get from a ship to the forts and back again under eighteen or twenty hours.

Here therefore there was no inducement to stay longer than was actually necessary. The French frigate was here only while the Admiral went to Tientsin, and they were counting the moments for their departure for another port. Therefore having communicated with our minister on the subject on the 26th, we sailed from this anchorage in search of a more desirable part of the coast.

Since the coast of Pechili, notwithstanding it is washed by an imperial gulf, according to the Chinese, does not contain a single harbour either good or bad, we determined on seeing the great wall, and for this purpose to anchor off any part of the coast, as it was worth while to be where there was at least something to be seen. We therefore shaped our course with this object, but on the following day we had a furious storm from the N.E. with so much sea, that after striving with it for several hours as it was against our route, it was considered better to seek shelter rather than subject the ship to such bad treatment. We therefore lighted our fires, and leaving the gulf of Pechili on the morning of the 28th, made for the Miau-tau islands, anchoring under the lea of the island of Chang-shan in the evening of that day.

In this island, overrun as it is with people in every corner of it (like most other places in China), where the excess of population renders it difficult to find a place that is not filled, there is excellent shelter at its anchorage from northerly winds, round to east or west, and which winds are the worst that blow in the whole gulf of Pechili. Although it is very small it contains five or six villages, each of forty or fifty houses; and the whole of it, like the adjacent islands, is cultivated with that minuteness and care, that is found in the imperial grounds of China, a country the best cultivated in the whole world, without even excepting Belgium itself. Besides its cornfields, there is nothing particularly remarkable except a pagoda dedicated to the virgin Tian-han, the patroness of Chinese navigators, which, the pious deeds of the sailors of the Yellow Sea have enriched with innumerable models of junks and small craft of all forms and sizes; as religious

offerings in token of their prayers for delivery on some tempestuous night, any of which memorials would look well in our museums as perfect specimens of the kind of vessels employed on these shores.

We stayed at Chang-shan anchorage for finer weather, and as soon as it cleared up we went to Teng-Chau-Fu, a short distance off, and anchored there on the evening of the 30th May. Teng-Chau is a second rate city of China, one of the centres of population (Fu) that are classed next to the three capitals of Pekin, Nankin, and Canton. The name *Teng-Chau* signifies an advanced city, which it no doubt owes to its situation at the entrance of the gulf of Pechili. It is surrounded by a wall of formidable appearance, one face of which opposite to the sea, is about two miles long, without any cannon on it, but yet might easily receive them. According to the governor Chifu, it contains 230,000 inhabitants.

Its streets are wide and, an uncommon feature to be found in China, they are also straight. They are adorned with a large proportion of extraordinary stone buildings, and a kind of triumphal arch which crosses the street from side to side. The granite fronts of these arches display fantastic figures and inscriptions. These monuments, some of which are of undoubted excellence, and all of them of considerable artistic merit, are due to the vanity of the mandarins of the higher order who have resided here and have thus effected the record of their memory. They all bear different dates, from the remotest antiquity down to modern times; and judging from their number, for they are found plentifully in every street of the city, Teng-chau-Fu must have been the favourite retreat of the highest dignitaries of the Chinese Empire.

But the place is almost entirely without exterior commerce, although it has one of the most abundant of grain markets to be found on the shores of Pechili. It has, however, a large trade with the interior provinces by means of roads to make up for the absence of the foreigner. And probably from this circumstance, as well as from its bad roadstead, it is that this city has been so little frequented by Europeans, and that for the last five years the only vessels which have been there are a French and an English gunboat.

It was with no small surprise then, and I could scarcely believe the fact, that the only vessels I found here were Chinese, and that I met at Teng-Chau only six or seven English-American protestants, who had been residing in this city for four years. As soon as we had anchored, they all came on board with their wives and families, anxious, as it was naturally their desire, to see white faces; and all the time we remained, they did all in their power to make themselves serviceable and agreeable.

I cannot help observing here, although from mere remark which I soon found did not apply to this place only, the extraordinary contrast there is between the Roman Catholic and the Protestant Missionary in China. The Spanish Dominican friar, like the French Jesuit priest, who teaches the divine word and holds out Evangelical light in those distant regions, goes single to China, and without other resources than

those of his faith. He allows the beard to grow (note—whiskers and beard in the original), he shaves his head, he braids a long tail, he dresses himself as a Chinese and learns the language of the country. Thus he penetrates into the interior of the Empire, living with the Chinese, and like the Chinese is frequently persecuted by the mandarins, sometimes dying even as a martyr: and thus he exercises the religious propaganda, founding the teaching of his belief in the love and confidence with which the natives inspire him, and more especially of that class of poor whose sorrows he partakes of, and whose tears he dries with the holy means of charity!

But the protestant missionary is quite another person. He begins by removing his family to China, wife, sons, and daughters. There they establish themselves as comfortably as possible, according to the peculiar condition of the country. This missionary always goes about dressed as a Levite, with white cravat and black hat, as if instead of being in the Chinese Empire, he really was in the United States or in England. His house, fitted as European, is conducted as much as possible according to the custom of his country. There they tread on carpets, play the piano, receive ladies' company, give parties of certain pretensions, and I know not for why, but they do not dance.

The missionary is a kind of Consul. He deals with the foreigner as an equal, even so with the local authorities, with whom he sometimes differs and then threatens them with the displeasure of his government when matters do not go to his liking. Just at the time of my arrival at Teng-Chau-Fu, something of this kind had actually happened in consequence of the missionaries complaining that they had not good lodging. Still those lodgings which I saw were not only commodious and spacious, but even better than those which are generally found in China. I have been since enabled to satisfy myself that the dwellings of these apostles of protestantism, were not worse in any respect than those occupied by our whole legation at Tientsin, and these were by no means badly lodged. And notwithstanding one of the complaints against the Chifu of Teng-Chau (that by my means was transmitted to the minister of the United States at Pekin) was founded, according to what I learnt from the missionaries themselves, on the charge that that mandarin influenced the proprietors of the lodgings in the town not to let them have the houses they desired, and they had therefore to take those which they occupied. I do not relate this incident in censure of these persons, to whom I, as well as the officers of my ship, was under great obligations for attentions which they heaped on us during the time we were at Teng-Chau. But it presented itself as a case in point quite accidentally, which serves to illustrate the subject, being a remarkable characteristic, shewing in broad colours the difference between the two kinds of missionaries. The humble Roman Catholic, in the Chinese garb, and concealing himself among the multitude that he may be an unknown person. The proud Protestant preserving his peculiar attribute, imposing conditions and raising his voice in the tone of complaint against the authorities, not for placing obstacles to his preaching, but because they do not facilitate his getting a good lodging.

However it is pretty well known how the Protestant propaganda is received. Here bibles in Chinese are profusely distributed, and the natives are left to read them as soon as they can, or rather to make what use of them they please. On Sundays the families of the missionaries with their servants collect together in the chapel, and after the reading of the Psalms they are preached to in English——to Chinese! It must be confessed that the method, besides being very troublesome, was well adapted to spread a knowledge of European language in the country.

Among the missionaries here the superiors only knew the Chinese language. The rest I am told scarcely understood it, an ignorance which admits of easy explanation. All of them were under somewhat similar circumstances to myself, who, in spite of having been at various times more than a year in the Canton river, scarcely know a word of the language. Instead of being occupied about Chinese, I was attending to my ship. And very naturally with their families by their side, like me on board, they have employed their time about them, time which the Roman Catholic priest passes in the dwellings of the indigent Chinese, forming indeed one of their families.

In fact, to my view of the subject, the Roman Catholic missionary becomes naturalized in China, while the Protestant always remains a stranger. This is the great difference which I have been enabled to observe between them. As to the moral difference, that is an affair in which I have no desire to touch on. All I can say is, that the Catholic priest dressed as a Chinese, with his head shaved, his long whiskers and his collar spread over his shoulders, has always inspired me with a profound feeling of piety, sympathy, and respect; while the Protestant, dressed as a European with gloves and cane, and his wife on his arm walking the streets of China, has been looked on by me as merely a traveller like myself visiting the Celestial Empire from mere curiosity, or rather as a merchant occupied in the traffic of bibles, instead of attending to the trade in opium.

(To be continued.)

[The foregoing comparison appears to us, as more becoming the pages of a journal like this, than those of a report of an *official nature* from a naval officer to his Admiral. It may be very true, but at the same time, as it carries libel, and as it will no doubt meet the eyes of those concerned, let them understand that our pages are open to their remarks on the principle of *audi alteram partem.*]

Another telegraph line to India is in contemplation. The route proposed is *viâ* Prussia, Russia, and Persia, joining the Indian Government cable at the Persian Gulf. Concessions from the Prussian and Russian Governments have been obtained. A company, to be called the India, China, and Colonial Telegraph Company, is about to bring forward a third scheme. They propose to lay cables from Falmouth to Gibraltar, and from Gibraltar to Malta. Probably from the success of the Atlantic Cable, and the facility with which it has been repaired, submarine telegraphs seem to be returning to public favour.

The Indian and Atlantic Telegraphs.

(Continued from page 155.)

Such a project may be on too grand a scale and three years have passed since it was promised to be done. The directors of the enterprise have even certain works to carry out on the desert shores of British America to the north of Vancouver's Island. Here are to be found only the small trading ports of the Hudson's Bay Company, and materials as well as provisions they have to bring with them. Besides being a commercial patriotic enterprise it is also a voyage of discovery through an unknown country. Towns will be formed, which there will be the satisfaction of naming. Gold mines will be looked for which will be a most important discovery, a point of view which will attract abundance of adventurers whose presence cannot but be useful. Do the works progress rapidly? Do no insurmountable obstacles appear in even the northernmost parts where the cold is so severe? This route has our best sympathies, but when established the despatches between New York, London, and Paris would rather cross the Atlantic by steam than travel the Russia-American line and by Siberia. The evidently greatest use of this line will be placing China at the extreme east, in easy communication with America and Europe.

Still to establish communication between the old and new world we return to the Atlantic cable. The great importance of this method a single notice will prove. There is a regular service every year of 1196 steamboats crossing the Atlantic, between England and the United States, conveying English, Americans, French and Germans, to which may be added a considerable number of occasional voyages. It may also be said that the seventeen packet companies running vessels across are proposing to increase the number of their ships, and new companies are also in contemplation. There seems then every prospect of the great intercourse thus going on being increased. And now let us see the service which a submarine cable can render under these conditions.

It has been observed that one of the greatest drawbacks to the electric cable is the necessity of proceeding very slowly in transmitting messages. Estimating English words as being composed on an average of five letters, French words are much longer. Now electricians of confidence state that the Atlantic cable of 1866 can transmit six words in a minute, they also consider that this number will be doubled and trebled by a process under experiment. But six words are now a certainty, that the daily work lasts for twenty hours, which is enough for day and night work, that there is not a fourth of the words sent on account of repetition, the requiring of answers, and the transmission of orders, which is less than the usual number, it results that there are perhaps above three hundred despatches sent in the course of the day, and with two cables these would be doubled. Then besides this there are the real requirements of commerce between the

countries that would supply thousands of messages. The cable being a means of promoting expedition it becomes necessary to limit the number of the despatches to the probable capacity of the cable. And the least number will be found to raise the tariff to an exorbitant sum. Consequently the cost of a despatch not exceeding a hundred letters has been fixed at 500 francs. A little calculation only would shew that the annual receipts of a cable would amount to the enormous sum of forty to fifty millions, which has been in force in the Atlantic to be received to clear the expense of laying the cables.

One naturally enquires if these precious lines are to have a year's duration. Without knowing the causes of the failure of the submarine cables one can remember that all the cables laid down as yet in very deep water have had but a precarious existence, and have failed when this was least expected. Such facts are known even among those learned societies so well, that a member of the Academy of Sciences has applied to astronomers to obtain the use of the telegraph to determine the exact difference of longitude between Ireland and Newfoundland. He has been answered, and not without reason, it would be a novelty to offer to the company a longitude in return for dividend. The electric cables are in reality public property. And it is but right that savants should pay for their use like any one else. Therefore it is to be hoped that the communication with America will be subject to but short intervals of suspension. Certainly there are causes enough at work to destroy them. They may be destroyed by resting on a rock at the bottom, that the protecting cover of the cable may be broken little by little, and will at length be too weak and become broken. Sometimes atmospheric electricity will penetrate into it, consume the covering, leaving the wire bare, which can perhaps only arise from carelessness in being laid. Earthquakes may change the surface of the bottom of the sea on which the cable lies. The greatest danger even arises from the electricity used with them for signals. The cable like everything else becomes used up with time. Will it last two months, a year, or ten years? What we know at present is that no cable has lasted in a good condition longer than two years. And nothing has yet shown that more may be expected in future, for the checks hitherto have yielded their fruit, but they have shown those who have to use them, the necessary precautions how to avoid accidents.

It was to avoid those interruptions which sooner or later happen to submarine cables that prudent engineers imbibed the idea of not laying them in a very deep sea, and that very large and strong cables should be used. It was on these principles that the line between Malta and Alexandria was laid, which does cross depths greater than 300 metres in a length of 2500 kils., in 1861, and in 1865 that of the Persian Gulf was laid which in an extent about the same lay even in smaller depths. The result has justified the reasoning. The line between Malta and Egypt has been often interrupted, but each accident was repaired after a short delay. The Persian Gulf cable has also experienced some fractures and the communication has

been easily re-established. On the other hand it does not yet appear that a great depth of water over the cable is any guarantee against future risks. It is therefore to be considered what in all cases is the chance of repairing or regaining easily for repair the two ends of a cable in the open ocean. The Atlantic Cable is an instance of this kind, the most unfavourable. There was even reason to believe before the last expedition of the *Great Eastern* that such an enterprise presented insurmountable difficulties. The operation is not impossible for it has already been effected, but at all events it will always be most difficult and most expensive.

There is no doubt that the successes of the last two years are of a nature to give a spur to oceanic telegraphic enterprise. But let us in conclusion analyse this new species of industry and the most useful as well as most practicable part of the subject. The different projects of it are no doubt most numerous, and calculated in the present state of science to do much towards it. In ocean telegraphy there are four points to be attended to. First the conducting wire must be isolated in order that the electricity be not lost on its passage; the second to know the proper thickness or substance of it and the envelope of gutta percha, so that the cable once laid down may have its best effect, then to lay down the cable, and lastly, to ensure its efficiency as long as possible. The first of these points may be considered as set at rest long ago. For the last twelve years the manufacture of the cable has been satisfactory. The second gives no anxiety to engineers when the distance does not exceed 500 miles, and if it be true that twelve words a minute will hereafter be sent through the Atlantic Cable there will be nothing more wanted in either case. As to the third point recent measures have shewn that there is no difficulty in laying a cable that is well made in the deepest part of the ocean. In all this the patience and energy of the English companies have quite prevailed. The fourth question, to preserve a good condition in the cables as long as possible repairing them as necessary. Such are the points which demand the most attention. To sacrifice millions for the sake of establishing a communication which may fail on the very first day is somewhat alarming.

When considering this question it will be well to look at those projects both in France and England that have been proposed to avoid the difficulties of submarine cables, and in taking one after the other it will be easy to shew that the inventors have always neglected one of the points of the question. Generally speaking perhaps they have not blinked the different difficulties of laying down, for this is a process which has been fatal to them. It is the weak side which is not thought anything of by the public and consequently they are suddenly informed that their pains and trouble have been lost. Cables made in a special manner have resulted from this, generally too slight, and machines have been invented by which they are laid down. There is no doubt that the views of engineers on this subject are definitely fixed. The Persian Gulf cable and that of the Atlantic are models accepted by all the world as the best adapted by those who have well considered

the subject. They have formed the models for all others and all other kinds have failed. To proceed then with the same to improve it if possible, where defection without introducing sadder radical innovations, is the safest mode of arriving at an entirely satisfactory result.

When one considers the history of useful public works one is struck by the analogy there is between the progress of two distinct ones when they each strive against the same element, with a very different object, for instance oceanic telegraphy and the construction of bridges over large rivers. In the sixteenth and seventeenth centuries these were built at hazard, in the same way as for ten years cables have been immersed, without our knowing the conditions which they have to meet. Up to the time of Louis the fourteenth, bridges built with difficulty were carried away by a freshet or some catastrophe, sometimes indeed these took place before the workmen had laid the last stone. How often have our cables broken even while they have been laying down. We can compare the checks of the Atlantic line with the famous ruins of the bridge of Moolins on the Allier, which after giving way in 1684 and 1689 before being completed, was again undertaken in 1708 with no more success, until at length happily completed in 1762. The contractors in early times were unable to sink the foundations. They could neither calculate the force of the river nor the resistance of materials. How then could their works endure? It was one of the glories of the engineers of the eighteenth century to have determined the laws of their art. It will be one of the glories of the engineers of the nineteenth century to have conducted the electric fluid across the ocean in spite of the depths by which they are obstructed and the storms by which they are agitated.

Thus we see the result of the exertions of fifteen years, and from thence it will be more easy to reason on what may be done, and to discuss the lines which it is proposed to undertake. It is evident that they may be fearlessly undertaken and with certainty of success, at least those which do not go into very deep water, those for instance which do not diverge far from the coast. Those which concern the East nearly all comply with this condition. Thus the English desire for lines in communication with the East Indies, such that shall be less subject to delays than they that are in existence. The course of such a line is even defined. It will cross France and Italy and will be submarine between there and Sicily, Malta and Alexandria, where there is already a line, but which will be doubled for the sake of security. From Alexandria it will be easy to connect Diarbekie and Mesopotamia by the coasts of Palestine and Syria or to re-establish the old line by the Red Sea and Indian Ocean by Suakin, Aden, and the South coast of Arabia. In the present state of science it would be easy to avoid the mishaps of 1860—61, in an enterprise of this kind. Between England and British India there are but two foreign countries, France and Italy, where the transmission of despatches to a great distance is thoroughly organized. Beyond there may be considerable delays.

Other proposals have been made to the British Government to connect by the electric cable their flourishing colonies to the East of

Calcutta. The extent of the Telegraph reaches to Rangoon and it has even been extended in this distant province owing to the small postal communications. The projected lines will go from Rangoon to Singapore by Tavoy and Penang, from Singapore to Hong Kong by Saigon where the French are interested—or by Sarawak, Labuan, and Manila, which will be to the advantage of the Spaniards: and finally from Singapore to Australia by Batavia and Coupang. All the seas that are here to be crossed are of a small depth. Between Java and the coast of Australia only there is said to be a volcanic gorge on which there is a depth of not more than 1800 yards. This after all is but a slight obstacle in comparison with the difficulties already overcome.

But there can be no doubt now that the Atlantic cable has been laid, engineers and financial companies will turn their attention to these matters. The success of the Great Eastern will raise rivals to the old company. But these have no reason to fear such rivals as they have the monopoly of all the shores of Newfoundland. They can hold in check by this privilege the intermediate lines which might be easily laid between Iceland and Greenland. But the Atlantic will be studied from one pole to another with the object of finding the latitude that would be most likely to yield success. It suffices that the first adventurers with their confidence in ocean telegraphy have at length made a good business of it. Money is not wanted for good speculations. The interests of commerce and political matters require the establishment of additional lines, and by reciprocal agreement the expense of intermediate despatches can be arranged.

Among the projected lines one is mentioned from Portugal to the Azores and Bermuda. It may be that hydrographic considerations may not be favourable to this line, for the sea surrounding the Bermudas has always been wrongly considered as the deepest between Europe and the United States. There are other proposals for crossing the Atlantic by the Azores and the Isles of S. Pierre and Miquelon. This project would specially interest France, not only because these small islands belong to her but because a route thus re-established would be in favour of a correspondence with North America. The line from Ireland to Newfoundland is an affair of England: that of Siberia and Behrings Straits will avail Russia; while that of the Azores and S. Pierre concerns France. It is worthy of remark that the lines of cable in this route will not be long and that there are shallow parts which will render the laying of the cable comparatively easy. This line in fact presents as many advantages, which sooner or later (unless it becomes a monopoly) will be realized.

In fact in whatever point of view the subject of modern electric telegraphy is looked at, it will be evident that for some years there has been more matured judgment in the enterprises and better management in their execution. This modern art has already produced great results in spite of the great obstacles by which it was opposed. It is only necessary that engineers presevere in the course they have taken and no limit can be set to their future success. The spirit of speculation encouraged by the grand results of the Atlantic company

will of course promote the most difficult enterprises. This is indeed a species of industry the progress of which is certain. No one can complain of that progress not being rapid. It is not five and twenty years since electricity was adapted to the sending of messages, to sending the first despatches, and now in our days it travels from one end of Europe to the other, even crossing seas, it bears to us intelligence from Calcutta and San Francisco. A little more and it will make the circuit of the globe. And no great event can occur on that surface without the same day seeing it known in the midst of France.

[The fact that the Atlantic cables, in spite of every objection, have recently realized the enormous sum of £1,300 for each of three consecutive days, is a pretty good answer to *all objections*, in this, the third year of its existence, and in deep water too, which seems to improve rather than deteriorate it.—ED.]

THE MARITIME RESOURCES OF SOURABAYA IN JAVA.

Gentlemen,—In your Number for May, 1867, I met with an article, called "*The Maritime Arsenal of Sourabaya.*" But what is told about it is so far from the truth, that I can't forbear correcting some of the unknown author's statements, founding my authority on the fact, that I have not only been for some time an inhabitant of Sourabaya, but also am employed at the Maritime Arsenal (naval dockyard?) of that town, and asking some indulgence for my writing in (to me) a foreign language.

Among other things, the author says, that nobody at Sourabaya works more than two hours a day at his office. Believe me, sir, never was a more unjust or unfounded blame ever laid on the activity and working spirit of the European inhabitants of Dutch-India, and I hope you and your readers will form quite another opinion thereon, when I assure you, that most of the Commercial offices open at eight a.m., and close at four or five p.m. While at the dockyard and other similar Government establishments, business begins at six or half-past six a.m., and ends at three or half-past three p.m. I may add, that eight or nine working-hours a day are more than sufficient in this *lovely* climate, when for the greater part of the year, awfully hot days are succeeded by scarcely any more refreshing nights.

The town of Sourabaya is divided into three principal and distinct parts, thus, first at the seaside, the dock, or as the notices have it, the oedjong (corner). This part is formed by the maritime establishment alluded to situated in the corner, made by the Haliemoos and the Strait of Madura.

Ascending the Haliemoos (gold river) for a good distance, you arrive at the real town, which is wholly built of stone. Here you find all the public and commercial offices, the churches and other

public buildings, the clubs, some factories of different kinds, barracks for troops, the Arab, Malay, and Chinese camps, and the residences of a great many European inhabitants.

The third part, situated just outside the forts, is called Simpang, and consists chiefly of the villas and country seats of the wealthiest inhabitants, as well of government functionaries and magistrates as of the principals of Commercial houses. Simpang presents, at many points, a beautiful view, and may in some respects be compared to the prettiest parts of Batavia, the well-known Capital of the Isle of Java.

I should most certainly trespass much on your pages, were I to give a further and minute account of the town of Sourabaya as well as some statistics about its population, import and export trade, etc. But I will thus, at present, merely give your readers a little description of the naval dockyard, where I have the honour to serve, and the existence of which, in these days, presents an interesting instance of perseverance and patience; for the whole establishment was, some twenty years, with the aid of a very poor set of native workmen, in the full sense of the word, dug out of the sea and built upon a ground, that is for the greater part nothing but a marsh.

In the middle of this dockyard there is a spacious wet dock, in open and direct communication with the sea, and thus subjected to the flow and ebb of the tides. The dock is surrounded by different buildings, consisting of the dwelling-houses of the officers, the working shops, the store houses of provisions, coals, and all kinds of articles for the use of the navy and the yard itself, etc., besides a camp for a portion of the native workmen.

As the oedjong is quite a little colony in itself, with its own police, medical attendance, etc., it has a police-court, a very nice club house, recently opened just at the corner of the sea and the river, while regularly every Sunday Divine Service is held in the sailmakers' store, alternately for Romanists and Protestants.

In the spacious wet dock abovementioned, a floating wooden dry dock is moored, which may be used for vessels not exceeding 200 feet in length, while next to the dockyard there is in course of construction a spacious iron floating dock, 350 feet long, which, when finished, will present a beautiful specimen of these iron structures. There is also a patent slip, covered by a fixed roof of stone and wood, with galvanized iron plates. This slip however has for a couple of years been otherwise applied: for instance in the building of a large wooden paddle transport steamer, called the *Sourabaya* (length over all about 230 feet, breadth of beam thirty feet), which vessel some days ago was successfully launched, and may be considered as the pioneer of shipbuilding in this colony: a branch of business which, up to this time, went no farther than the construction of some small steamers and coasting-vessels. The *Sourabaya* is built entirely of Java-teak, and with much care and attention to her strength, she may be considered as a vessel of great durability.

Two building-slips for vessels of the greatest dimensions, that may

with profit be used in the waters of the Indian Archipelago, are likewise in course of construction, and now almost finished.

A powerful pair of sheers for shipping steam boilers and other heavy articles, an iron crane and several lighters and other craft facilitate the usual routine of work.

Two steam dredges are continually in action to prevent the enormous fouling of the dock, and keep the entrance open for the movement of shipping; and thus, thanks to this machine, even large steam vessels may enter and leave it at full speed.

For the use of the war-vessels that are under repair at the dock-yard there are ample houses and barracks for the officers and crews, while, as before said, the European employees are all living at the reonde and along the Haliemoos in government houses.

A surveyor and master-attendant, belonging to the royal navy, a master-shipwright with a first and second-class assistant, a storekeeper, a purser, and a chief-engineer, rule, with their subalterns and clerks, the work at the dockyard.

The workmen and their foremen (called man doers or, by the Dutch term, boas) are all Javanese, Malay, Madurese, and other native people. They are paid every day at the close of work, and although many of them serve continually, a lot of them, for instance the coolies, for hauling, hoisting, cleaning, rowing, and other purposes, are changed almost every day. Their wages at the royal building yard differ, for the foremen from one guilder to one and a half; and for the carpenters and caulkers from a half guilder to one; while the coolies always get forty cents. every day. About 800 to 900 of them find their daily occupation at the dockyard, sometimes this number far exceeds a thousand.

The part of the repairs which relates to iron vessels, such as boilers and engines, is done at a spacious workshop, situated in the town, up the river, and working, under separate directions, in combination with the dockyard. New boilers and steam engines of all kinds are made there whenever wanted perfectly well.

This place possesses also a patent slip, extending into the river, that is used for the construction of those small iron steam vessels, that are commonly made in Holland and sent out to India in pieces.

A surveying-engineer acts as chief and is assisted by two other engineers, and a storekeeper, as also a purser, besides a number of European founders at the foundry, the smithy, the turning shops, etc.

And herewith, Mr. Editor, I finish this little sketch, to which, as a rectification of the article alluded to about the second town of Dutch-India, without doubt, you will not refuse the insertion in your pages.

It does appear strange that while so many English vessels anchor in the beautiful roadstead of this town, you should not have had before any better information than the meagre one you lately have given us, to be superseded by this, from yours truly,

WM. BOEKE,
Assistant Master Shipwright
at the Naval Dockyard.

SOURABAYA,
November, 1867.

P

[Our correspondent has done a service to the maritime world by sending us this communication, and we are glad that the few remarks on Sourabaya in our last year's volume, to which he has alluded therein, seems to have occasioned his remarks. It is to the entire absence of such communications that the ignorance of the maritime resources of Sourabaya of which he complains may be attributed. It is well known that Sourabaya has a beautiful roadstead, but its resources are not so well known. And this information he might occasionally give in this journal, as it always was one of those purposes for which it was established.—ED.]

THE SANDWICH ISLANDS.

The Reciprocity Treaty with the Sandwich Islands as a Measure of State and National Polity.

(Report of the Chamber of Commerce.)

[THE following interesting document appears in the principal weekly paper of the Sandwich Islands, and although it ostensibly bears the name of a report from San Francisco, there is that appearance of an official character about it, even if it be not expressly stated, that points to the name of the American Statesman which it bears as likely to have more to do with its authorship than the "Chamber of Commerce" of San Francisco.

The object of it however is so important, and that object is so openly revealed in many parts of it, that it cannot fail to secure attention. A reciprocity treaty is well calculated to draw the two countries together between which it is made, and that before us openly says, that, if it be carried through, the Sandwich Islands are so much Americanised already, that, in seven years, when the treaty expires, the islands must become one of the United States! when of course, at the pleasure of those States, we or any European Power are to be shut out of the Pacific.

This may be good policy of the Americans, and this is not the first time it has been advanced, but it seems to be a measure of too much importance to be settled as some points are off hand; for looking at it from a point of view in which every nation of the world is concerned, the Sandwich Islands should belong to no one but themselves; so that in spite of wars, they might remain (as they always should be) a neutral country. The arguments so forcibly used to *annex* them to the United States operate more against them for that end when the interests of all Europe are considered.

The persuading manner in which the islands are stated in the "Report" to be "*off the coast of Lower California*" seems a very convenient but vague expression. The nearest land to them is really that of the Aleutian Islands. But they are comparatively lonely in the North Pacific Ocean, off no important land as the expression is applied, and in round numbers are distant,

From San Francisco	2,010	nautical miles.
„ Cape Mendocine	1,980	„
„ Cape St. Lucas	2,520	„
„ Aleutian Islands	1,860	„

so that if they are allowed to be "off Lower California" they are very far off indeed and nearer to other land.]

The Report says:—

1. The Sandwich Islands lie off the coast of Lower California. Their united area is about 6,000 square miles, of which one-eighth, or 500,000 acres, is represented as fit for grazing and tillage. They possess a climate salubrious for Europeans and citizens of the United States, fine harbours, and sheltered anchorages; in fact all the requisites for a naval depot, refitting and victualling station for a first class Power, combined with considerable internal productive capacity.

2. They are owned and occupied by about 3,500 native Hawaiians and half castes, and about 3,000 Europeans and Americans. The native population is rapidly decreasing, and in all human probability will during the present century either become extinct or lose entirely its indigenous character by admixture with foreign races. In 1832, when the first official census was taken, their population numbered 130,313. In subsequent census-takings the numbers read 108,000, 84,000, 73,000, 67,000.

3. The soil is in the hands, mainly, of native chiefs. The Government is monarchical moulded partly on that of England. The preferences of the King are understood to be American, while those of the Royal Family incline towards England, at the court of which nation, from time to time, its various members have been entertained.

4. England, France, and the United States covet the possession of these Islands, and have each made, in past years, both overt and open attempts to obtain them. They are the object of a tripartite treaty existing at present between those Powers, in which each pledges itself not to seize them, but almost innumerable have been the secret negociations, conspiracies, and diplomatic bargainings by each Power to get their possession without seizure. Some of these attempts would have long ago been successful, were it not that each Power has vigilantly watched and counter-plotted against the others.

5. The reasons for this anxiety are obvious. So long ago as 1841, John Jackson Jervis, of Boston, in his work on the Islands, says, "Should any of the great Powers seize upon them it might be considered as holding the Key to the North Pacific; for no trade could prosper *or even exist*, while a hostile Power, possessing an active and powerful marine, should send forth its cruisers to prey on commerce." Speaking of the Islands for defence, he says, "a military colony once fairly established on them might put at defiance any means of attack which could be brought to bear against them."

Since the time Mr. Jervis wrote, the progress of events has to the United States added ten-fold force to these facts. What was evident in 1841 is in 1867 of paramount importance. Since that time the whole Pacific Coast, from the frigid zone to the edge of the tropics (except British Columbia) has become the seaboard of the United States.

The third capital of commerce in the Union has arisen on this Bay; a railroad is being made to unite New York with China, Japan, and the East Indies and Archipelago to the west of us; to Oregon and British Columbia to the north; to the south, Mexico, Chili, Peru, and Australasia. Our merchant marine, our coasters, and our whaling fleet, swarm everywhere in the Northern Pacific.

Opposite the very portals of this commerce, and directly in its track, lay these Islands, keeping, as it were, watch and ward over us and over this entire coast and its commerce. Plant an active enemy on them, and let him fortify himself there, if he were the smallest of the maritime powers, he would probably annihilate this commerce: a power with a fleet consisting of only the *Florida* and *Alabama* would, intrenched in these marine fortresses, harass all profit out of it. In the hands of France or England the effect would be to enable either of these powers to shut us out of the great highway of the Pacific, and lock us up, so far as commerce is concerned, within our own mountain ranges, absolutely at its pleasure. The United States by keeping up an enormous naval armament on this coast could carry her flag with her floating batteries in defiance of such powers and their mid-ocean fortress, but *commerce would be suspended;* and so important has this commerce of the Pacific become to the United States, so great is its present proportions, and so intimately blended with the nation's hopes and interests is its prospective growth, the very knowledge that a hostile power, so located, could at will destroy it, almost without cost, would compel the United States in all international intercourse to take a humbler tone and be less independent in urging its own views;—for nations, like men, intuitively bate their breath in the presence of a power which can, if disposed, inflict on them a great injury with small effort.

Secretary Seward is in a position to feel this daily far more vividly than we can do. His responsible office compels him constantly to pause as he dictates his foreign despatches and think, "can I urge this or that and if it gives umbrage dare I persist, and if I persist what will be the consequences?" Give France, for instance, these Islands, and with them the power to destroy American commerce in the Pacific, and the Secretary would shrink from the consequences of giving offence to that power, even were his views the desire of the nation and entirely just in themselves.

This great statesman looks to the time when British Columbia will fall peacefully and by mere force of circumstances into the United States. Already he is clearing away the impediments of private interests by negociating for the Hudson's Bay Company's property and claims. These acquired, British Columbia will be only a wedge of coast uncomfortably inserted in American territory, a cause of irritation to the United States without corresponding benefit to Great Britain,—a distant and isolated appendage to that Power, costly to maintain, entirely unremunerative, a mere care, barren of honour, and nationally valueless, which in the progress of the present consolidating policy of Great Britain, will be yielded to the United States for some equivalent advantageous to both nations, and thus become a portion of this compacted Republic.

6. The policy of the age is to natural compactness,—to territorial unity with broad and marked divisions. Great Britain is compacting; Italy is compacting; this Republic is compacting; and with this compacting, nations are ridding themselves and the world of a thousand irritating points of contact, which, however puerile and slight in themselves, have been fruitless causes of great wars.

Our business is with the Pacific coast. Let us suppose that Secretary Seward's magnificent policy, seconded by the nation, matures into success, and from Alashka to Sonora there is no foot of coast, no harbour, landing place or anchorage, which is not American, and that these islands become, instead of a hostile stronghold, an outpost of American unity, an American fortress guarding this long line of seaboard, and watching in mid-Pacific over our extended and extending commerce. *Its safety is evidently assured.* Where could a hostile power obtain an inch of *terra firma* on which to plant his foot? Where an anchorage, a landing, or a shelter? Where could he get fuel or water for his fleet? Where repair his machinery, refit his ships, or hospital his crews, except in the Tropics south of us or in China? And is it probable that any such power will come all afloat from the other side of the world to butt his prows against an immense line of coast if forced to renovate his ships and men amongst the fevers of the Tropics? Will come a voyage of 10,000 miles into a sea, where "Land Ho!" cannot be sung from the masthead without "Wear off" being echoed back?

There appears but one conclusion on this topic, viz., That the honour and influence of the United States as a nation, the safety of its commerce generally, and the prosperity of the commerce of this state and coast particularly, would be promoted by strengthening our alliance with the islands at present, and their ultimate peaceful acquisition hereafter.

Will this treaty secure these objects? Can they be secured by any other and better method? It appears from the printed and secret history of the dealings of these islands with England, France, and the United States, that every attempt heretofore made by either of these Powers to obtain them by seizure or cession, has been thwarted by the powferful influences brought to bear by the others. The attempt tending to this end which was the most nearly crowned with success, was a reciprocity treaty adopted by the Island Government through the influence of the Hon. Mr. Allen in 1824, which failed in the American Senate through the votes of Messrs. Benjamin and Slidell.

The present proposed treaty, though upon its face offering very large benefits to the Islands—immediate and direct pecuniary emoluments—was strongly opposed by the native and foreign population (other than American), and, though urged by the king, seems to have been consented to as a kind of last choice between utter agricultural and commercial population, and a reciprocity which they felt tends to their ultimate absorption.

It is supposed any attempt at purchase would have been thwarted by other Powers. They could offer *money* as much as the United

States. So far they stood with us on equal grounds and could with our bids have bid higher, but they could not offer reciprocity. A reciprocity between England or France and the Sandwich Islands would have been of less benefit to the Islands than a similar interchange with the United States, by the entire difference of the cost of transporting their raw material to Europe instead of to San Francisco. The Islands gain by reciprocity with the United States thirty dollars per ton on their raw material more than they could gain by reciprocity with England or France.

Mr. Seward knew where he had the advantage, and has taken this course.

7. How far will this treaty tend *immediately* to convert the islands into a defence and assurance of American commerce on the Pacific? It will naturally promote our intercourse with their population, and from that intimacy, combined with identity of interests, pursuit, and profit, American influence must increase in the native mind. The spirit of enterprise in our people and their close proximity will induce American citizens promptly to move on to the fields of commercial profit on the Islands which the treaty opens. Other nationalities move more slowly, are more distant, and will have less faith in the permanence of the union between the islands and the main—will, in fact, be behindhand in occupying the ground. The treaty practically will give a monopoly of the increased commerce and agriculture of the islands to American citizens. Its operation will be that by degrees, the native chiefs will sell their lands to the new comers, and the real property of the islands pass by purchase piecemeal into American hands; so that in all probability, at the expiration of this treaty, it will be difficult to say whether the people will be Americans in Hawaii or Hawaiians in America.

Immediately, the mere presence of so many Americans in the islands, would cause a hostile power to pause before attempting to make them a naval rendezvous, while the treaty itself will confer upon this Government almost the right—at least a very strong pretext—to arrest by force such occupation should it at any time be attempted.

8. But ultimately at the expiration of the treaty what probably will be its effect? It is not unlikely that from twenty to thirty thousand Americans will be found busy on the islands, digging, planting, building, fishing, thriving themselves and causing thrift in the country. Already eight-tenths of the skilled industry of the capital of these islands belong to Americans, and of the twenty-six plantations producing over one hundred tons of sugar yearly, twenty are now in American hands. Of one hundred and four commercial firms in the islands (which includes all of note) ninety are either wholly or partly American. The material interests, the fortunes, the daily bread, the accumulated savings of this pushing, working, intelligent crowd will at the expiration of the treaty be absolutely dependent on its continuance. To deprive them of reciprocity will be to turn their property from a benefit to a burden, their profits to losses, their industry to waste, themselves to bankrupts. And more than this.

The revenues of the Government from internal taxation, which by that time will have increased, and with that increase its expenditure also will be imperilled. It is more than probable that the active influence of the resident Americans, and the danger of exasperating them on the one hand with the prospective derangement of the inland revenue on the other, will be sufficient to induce the Royal Family and its adherents to yield to the logic of events and resign gracefully a position which they cannot maintain with comfort and honour.

The natural result will be the peaceful incorporation of the islands into the American Republic, in order to secure in perpetuity the profits and property created by reciprocity.

9. Let us next consider the probable profit and loss to this coast and the rest of the United States in a pecuniary sense, resulting from this treaty.

So far as this coast is concerned, it is impossible to find any item of loss which will accrue to its States or territories. The Reciprocity Treaty admits into the Sandwich Islands free of duty, our lumber, our manufactures of almost every kind, our food crops,—in fact everything that we can, profitably to ourselves, export. Its effect is to make us their bankers, their manufacturers, their carriers, and, generally their agents; and these not only for the present population and its business, but for the prospective increase under the treaty. For instance, suppose a sugar plantation be started at the islands. Nearly two-thirds of the total investment will be for machinery, buildings, fences, agricultural implements, and supplies of bread stuffs and clothing. These will come from here almost wholly. The loss to the United States' revenue is only in a very small measure, perhaps one forty-fifth of the whole, borne by us. So far as we on this coast are concerned, we can but modestly concur, happy that our position here enables us to catch without cost or effort the lion's share of the benefits of a measure of the national policy.

The profit and loss to the United States is an entirely different question, and no doubt it has been, and will be, well counted by the cabinet and the senate. Immediately the treaty looks one-sided enough. The Hawaiians abolish duties on American products which last year yielded to them some 64,000 dollars, while our Government admits duty free Hawaiian raw staples on which last year it collected about 450,000 dollars. During the seven years of the treaty, in all probability, this difference of apparent loss will be largely increased. The main item from which the revenue loss will arise is sugar. The *Hawaiian Commercial Advertiser*, in its yearly *resumé*, in the spring of 1866, places the entire amount of grazing and tillable land in all the islands at 500,000 acres and the amount of land suitable for sugar cane culture at 100,000 acres. This may be taken as an extreme statement, as the writer's object evidently was to make the showing as imposing as possible.

There are at present twenty-six sugar plantations estimated to produce one hundred to one thousand tons of sugar each annually. These plantations own in the aggregate about eighteen thousand acres of

land, and they actually exported, to all quarters last year, eighteen million pounds of sugar. At this ratio of land to sugar, the entire one hundred thousand acres suitable for sugar farming would be capable of producing a crop of one hundred million pounds of sugar or fifty thousand net tons. But in wild countries sugar plantations develop slowly. It will be fair work if in three years after the treaty, any new plantation sugar gets to market. Neither is it probable that more than half the lands adapted for sugar culture will during the early years be even attempted. A fair average export of sugar under the treaty may be taken to be the mean of the actual export of last year, and twenty-five thousand tons, the estimated export of the seventh year, or seventeen thousand net tons yearly.

If this treaty will secure the objects Secretary Seward has in view, the loss to the revenue is a trifling matter. How much would it cost to guard a coast such as ours, and a commerce such as that of the Pacific with a foe entrenched at the Islands, in comparison with the same service when no hostile fleet has a harbour, depot, or station on the Pacific? For every sailor and marine afloat in these waters, the disbursements, all told, for ships, guns, fuel, arsenals, and the numerous requisites of the service, amounts to two thousand dollars per man per annum; for a single thousand men 20,000,000 dollars yearly. The result of this treaty will, in all human probability, be to save to the United States, in defensive armaments alone, three times as much as the revenue loses.

10. But who will gain this supposed loss? In the first place consumers in the United States will directly gain a portion in the reduced price of the exempted articles, probably at least one fourth of the Government loss, leaving three quarters to enure to the benefit of the people of the Sandwich Islands. But that is not loss to the United States. At least eight-tenths of it will enure to the enrichment of Americans who are now in, or will hereafter go to the Islands. The increasing wealth of American units abroad swells the great American aggregate at home. When an American grows rich in China, in Europe, in Australia, or in those islands, his country grows richer by his wealth. The wealth of a country consists in something more than local assessors can influence or enrol. The individual power and influence of its citizens abroad are national wealth in the highest sense. George Peabody's English gains are American and not English wealth. Indeed they have made America richer, many fold, than if he had quietly accumulated them, as Astor did, in New York City. So in this case if the loss of this revenue is the gain of American citizens in the Islands, it is not lost to the United States, but transferred from the National Treasury, for special service, to the pockets of its own citizen volunteers abroad.

The following statistical statement is from the *Commercial Advertiser* of January 18th, 1868:—

Just at this time, frequent reference is made, both here and abroad, to the area and population of this group. Statements often appear, es-

pecially in eastern prints, giving an incorrect idea of both; for instance an exchange before us says the total population is but fifty thousand, and the foreign population two thousand. We give below the figures of the census, and also the area of the islands of this group:—

	Area Sq. Miles.	Height in feet.	Population—Census 1866. Foreign	Native.	Total.
Hawaii	4,000	13,653	572	19,226	19,808
Maui	620	10,200	605	13,430	14,035
Molokai	190	2,800	29	2,279	2,299
Lanai	110	1,600	9	385	394
Oahu	530	3,800	2,574	17,225	19,799
Kauai	500	4,800	392	5,907	6,299
Niihua	90	800	13	312	325
Kahoolawe	60	400	0	0	0
Total,	6.100		4,194	58,765	62,959

The total foreign population is 4,194
The total native population is 58,765

MEMORIAL TO CONGRESS.

Mr. Poulterer offered the following memorial:

To the Honourable Senate of the United States:

The Chamber of Commerce of San Francisco respectfully represent: That, in their opinion, the commercial interests of the Pacific coast will be largely promoted by the ratification of the Reciprocity Treaty negotiated between the United States and the Hawaiian Islands, and that public consideration having reference to the future expansion and security of our national commerce on the Pacific Ocean demands its ratification no less imperatively.

On motion of Mr. Rankin, the Secretary was authorized to transmit the memorial to our Senators in Washington, by telegraph.

LOG OF THE WAVE QUEEN.—*The Trade Winds.*

SIR,—We enclose abstract of the log and some remarks by the Master of our barque *Wave Queen*, in reference to her last passage to St. Helena, which may be worth perusal. We supply our ships with the wind charts, in which up to this time Captain Hoffmann was a firm believer. He now writes—"A careful perusal of the enclosed abstract of log and accompanying remarks will greatly oblige, I am no longer a disciple of Maury." "No one ever left England more confident of making a passage than myself. No one could have used greater exertions, and but few could more keenly feel so bitter a disappointment as I have experienced."

We may remark that the *Wave Queen* is a very fast ship, and the previous passage to St. Helena was made in fifty-six days, this time it was seventy-four. Yours obediently, F. C. NICHOLS.

To the Editor of the Nautical Magazine.

Abstract Log, WAVE QUEEN, *London to St. Helena, by Eastern Passage, recommended from November to May,*
ADAM L. HOFFMANN, *Commander.*

Date.	Long. W.	Lat. N.	Bar. Noon.	Ther. Noon.	Days out.	Wind.	GENERAL REMARKS.
Oct. 26	...	...	30·4	60°	3	W.S.W. ...	5 a.m., Bishop's Rock Light, N.N.E. 10', noon in double reef owing to pitching not wind.
27	6° 5'	48° 33'	29·50	59	4	S.W. ...	Hard gale, heavy sea running, close reefs and storm staysails, carried away whiskers and headrails.
28	6 29	47 41	30·1	58	5	N.W. ...	Light wind and heavy swell.
29	4 55	46 11	30·18	59	6	S.W.... ...	Moderate and fine.
30	6 15	46 6	30·18	62	7	S.S.W. ...	Light airs and calms.
31	6 39	45 48	30·1	62	8	Variable...	Ditto ditto
Nov. 1	7 15	45 24	30·08	65	9	E.N.E. to E.S.E.	Ditto ditto, dark overcast sky, heavy swell.
2	8 51	44 17	30·34	63	10	E.N.E. ...	First part light, latter strong and fine. Signalled the homebound Diamond funnel steamship, would not answer signals.
3	11 43	42 14	30·18	64	11	E., E.N.E., S.E.	Moderate and fine, strong sea, many vessels in company.
4	13 3	40 53	30·16	66	12	Variable...	Light airs and calms, hot weather, several ships in company.
5	14 8	40 29	30·0	67	13	S.S.W. ...	Moderate breeze at 8 a.m., spoke brigantine *Eliza Jane* (by trumpet).
6	15 35	39 55	30·80	66	14	S.S.W. to N.E.	Light variable winds, dull and overcast, rain squalls, several ships in comp.
7	17 6	37 56	29·70	65	15	N.E. to S.	Dark cloudy overcast weather, freshened to a strong breeze, 13 vessels in company, passed them all, 2 p.m. spoke ship *Serica*.
8	19 9	36 44	29·40	69	16	S.	Dark stormy weather, heavy gale at S., strong lightning throughout the night.
9	19 18	36 42	29·80	69	17	S.W. to N.W.	Strong gale and high sea, close reefs, 2 ships in company.
10	18 28	34 50	29·80	70	18	W.S.W. ...	Moderate and fine, 3 ships in company, 2 p.m. spoke French barque *Georges*.
11	18 4	32 36	29·80	70	19	W.S.W. to W.	Moderate and fine, 11 ships in company.
12	17 31	30 28	30·12	70	20	W.S.W. to W.	Moderate and squally—rain, spoke *Prince Waldemar*, Liverpool to Aden 20 days. Barque *Sir C. Napier*, Newport to Maranham 20 days. Portuguese brig *Laila*, Dutch barque, *Constantia Elizabeth*.
13	18 37	27 35	30·02	70	21	W.S.W. to N.W.	W.S.W. rainy to N.W. strong and clear, 6 p.m. sighted Palma, 8 a.m., 14th, Ferro.

Date.	Long. W.	Lat. N.	Bar. Noon.	Ther. Noon.	Days out.	Wind.	GENERAL REMARKS.
Nov. 14	18° 55′	24° 11′	30·18	72°	22	W. to N. ...	Stormy and clear, passing rain showers, 2 vessels in company. FIRST OF N.E. TRADES.
15	19 30	22 25	30·30	75	23	N.N.E. ...	Light and fine, employed shifting sails, 2 barques and a brig in company.
16	19 36	21 44	30·24	74	24	N.E.... ...	Light airs and calms, 3 ships in company.
17	19 39	20 59	30·30	74	25	E.	Moderate and fine, 3 ships in company, and a steamer bound S. LAST OF N.E. TRADES.
18	20 26	19 12	30·18	76	26	S.S.E. to S.S.W.	Light winds and dark cloudy weather, strong lightning to S.S.E., a barque in company.
19	21 48	18 7	30·12	78	27	Variable ...	Squally and rain throughout, dark stormy sky, thunder and lightning all round the horizon, winds flying right handed S.E. to W.
20	21 28	17 42	30·12	80	28	Variable ...	Light and variable, heavy thunder and lightning all round the horizon, continued rain, a barque in company, intense heat throughout the night.
21	21 27	17 30	30·12	80	29	W. & calm	Light westerly airs and calms, 2 barques in company, strong tide rips (no current).
22	21 30	15 48	30·12	80	30	N.E. to E.	Moderate and fine, water much discoloured, strong thunder and lightning.
23	21 5	13 7	30·10	82	31	E. to N.E.	Ditto ditto strong ripple, ditto
24	20 3	11 38	30·12	82	32	Ditto ...	Ditto (nearly black) ditto ditto no bottom, 100 fathoms.
25	19 27	10 26	30·10	85	33	Ditto ...	Wind very unsteady, ditto strong ripple, strong thunder and lightning.
26	18 57	9 50	30·10	82	34	N.E. to N. by W.	Ditto (much discoloured) ditto ditto
27	17 59	9 12	30·12	88	35	N. to N.W.	Ditto, and calms, ditto ditto ditto
28	17 34	8 42	30·12	88	36	Ditto & calm	Light and calm, spoke Venezulean brig *Fransisco*, Monte Video to Cape Verde 42 days, a barque astern.
29	16 45	8 3	30·12	86	37	Calm & E.	Light and calm, heavy thunder and lightning, signalled Dutch barque, name not in book
30	16 28	7 42	30·12	84	38	Ditto ...	Light and calm, heavy thunder and lightning, an American fore and after alongside fishing (whales).
Dec. 1	16 12	6 58	30·11	85	39	E.	Calm and very cloudy, terrific thunder and lightning, heavy to S.E., stowed all sail but foretop-staysail, 5 a.m. experienced a heavy tornado, lasting 2 hours.

Date.	Long. W.	Lat. N.	Bar. Noon.	Ther. Noon.	Days out.	Wind.	GENERAL REMARKS.
Dec.2	16° 34'	6° 21'	30·12	83°	40	S.S.E. ...	Calm and very cloudy, terrific thunder and lightning, strong tide rips, hard squalls, deluges of rain, terrific lightning.
3	17 1	6 34	30·10	85	41	Ditto ...	Light airs and calm, tide rips from S.E.
4	16 20	6 10	30·10	86	42	Variable ...	Ditto, squally throughout.
5	16 0	5 44	30·10	86	43	Ditto ...	Light variable airs, thunder and lightning and heavy rain, a vessel in comp.
6	14 37	5 51	30·06	86	44	Ditto ...	Ditto ditto heavy squalls, weather very oppressive.
7	14 39	6 0	30·06	86	45	Ditto ...	Light N. and N.W. airs, ditto noon signalled one of H.M.S. standing to the E.S.E.
8	13 24	5 34	30·10	85	46	Variable and N.W.	Ditto, terrific thunder and lightning, threatening weather, reduced sail to close reefs twice, no wind.
9	11 41	5 26	30·02	85	47	Steady S. by E.	Wind steady, weather fine, strong S. swell.
10	10 17	4 42	30·04	87	48	S.S.W. to S.W.	Light airs, calms, heavy rain, thunder and lightning.
11	9 44	4 15	30·04	85	49	W.S.W. to W.N.W.	Light airs, calms, heavy rain, thunder and lightning, dark gloomy weather.
12	7 7	3 28	30·04	86	50	S.W. to S.S.W.	Brisk breeze and cloudy, heavy rain, thunder and lightning.
13	5 11	2 35	30·1	86	51	Ditto ...	Brisk breeze and steady throughout, passing showers, many birds and porpoises.
14	3 13	1 55	30·1	87	52	Ditto ...	Ditto ditto
15	1 23	1 28	30·16	86	53	S.W. to S	Brisk and steady.
	E.						
16	0 14	0 56	30·20	86	54	S. to W.S.W.	Brisk and very variable.
17	1 16	0 3	30·12	85	55	S. to S.W.	Ditto, and cloudy. CROSSED THE EQUATOR.
		S.					
18	0 54	0 36	30·12	86	56	S. to W.S.W.	Ditto ditto
19	2 35	1 0	30·16	85	57	Ditto ...	Ditto ditto Passing showers.
20	0 53	1 29	30·14	86	58	S.	Fresh and very variable and cloudy, water much discoloured.

Date.	Long. E.	Lat. S.	Bar. Noon.	Ther. Noon.	Days out.	Wind.	GENERAL REMARKS.
21	1° 21′	2° 1′	30·12	85°	59	S.	Moderate and very variable and cloudy, water nearly black.
22	2 24	2 29	30·12	84	60	S. by E. to S. by W.	Ditto ditto
23	3 13	2 45	30·12	86	61	S.S.W. ...	Light and cloudy with drizzling rain throughout.
24	1 43 W.	3 29	30·14	87	62	S. to S. by W.	Ditto ditto
25	2 7	4 36	30·1	86	63	S. to S.S.W.	Fresh breeze and fine, strong southerly swell, pitching bows under.
26	2 23	5 35	30·8	85	64	S. to S. by E.	Ditto ditto
27	4 3	7 28	30·10	85	65	S. to S. by E.	Ditto ditto squally.
28	5 35	8 52	30·1	78	66	S. to S.E....	Brisk and squally, passing showers, strong swell from S. FIRST S.E. WIND.
29	6 32	10 31	30·14	77	67	S. to S.S.E.	Ditto ditto
30	6 31	11 37	30·18	79	68	S. to S.E....	Moderate and fine, cloudy and puffy at night.
31	7 38	13 31	30·20	78	69	S. to S.E....	Brisk and fine, strong southerly swell.
1868 Jan. 1	7 59	15 51	30·20	79	70	S. to S.E....	Strong Trades and high sea, pitching heavily in topgallants and light canvas, split jib.
2	8 0	16 54	30·30	75	71	S.E. steady	Brisk and steady Trades, strong S. swells. St. Helena, E. ¼ N. Mag. 140′.
3	6 12	15 31	30·30	78	72	S.E. steady	Ditto ditto St. Helena, S.E. by S. ½ S. Mag. 35′.
4	...	...	30·24	77	73	Variable...	Calms, squally, heavy rain showers, in topgallant, split fly jib, carrying top-staysail, 8 a.m. Diana's Peak, S.E. 20′ dist., noon calms.
5	...	...	...	...	74	... ...	Anchored at 6 p.m.

NOTE.—First of N.E. trades in 23° 30′ N., instead of 28° N. Vide Maury for the month. Lost them in 18½° N., instead of carrying them to 6° N., S.S.E. and S.S.W. dead ahead in exchange. Mean limit all the year round on the Eastern side of Atlantic Equator for winds if not S.E. trades at least with Easting in them 1° 25′ N., instead of which I got no Easting in the wind till reaching latitude of 5° 35′ S., when I got one point. Am driven by S. winds to 3° 13′ E. = 540′ to windward, and then cannot fetch the island. From Equator to the Island 19 days.

A. L. HOFFMANN.

NOTE.—Wind charts have been drawn up and published from the data afforded by notes and logs, purporting to shew where certain winds are to be met with. Are they correct? For my part I now believe them to be as correct as an Ephemeris would be, calculated by an astronomer, who made no allowance for the movement of the earth. In compiling the wind charts no allowance has been made for the movement of the storms, or of the ships on board of which the observations were made; and hence the winds met with *one voyage* are no criterion as to what may be experienced on the next. The clipper sails and makes a splendid passage, perhaps two or three. She sails again, and her commander, as he glances over the logs of previous passages, feels confident of success, SO MUCH SO THAT HE WOULD ALMOST STAKE HIS LIFE UPON THE ISSUE. She sails, but instead of her commander meeting with the "trade winds," etc., as he felt confident that he should do if he stood on a particular route, he finds to his chagrin that the whole system of the winds is apparently out of order, so that instead of having fine dashing breezes, *he is detained for days by light baffling winds.* He finds that his notes, logs, wind charts, etc., are all astray, "he has got into a streak of ill luck" (?) and instead of making "the quickest passage on record," he finds perhaps on arrival that some "old tub" has made nearly as good a passage as the crack clipper. How is this? I ask myself. How is it that the winds are so different from what they were on the last passage, and that they do not agree with the wind charts? The answer is simple: neither moon nor planets were then in their present position, and consequently their influence not the same. The gales have thus been accelerated or retarded in their rates of travelling, and the same portions of them have not been developed at the earth's surface. They have perhaps changed their track a little in consequence of a change in the electric condition of adjacent land or surrounding waters, or perhaps from causes which are yet unknown to us. Hence the difference in the winds met with on different passages. The wind charts which have been published are little better than waste paper. They are naturally erroneous, calculated on wrong principles, and no reliance can be placed in them.

ADAM L. HOFFMANN,
Wave Queen.

We have always looked on Maury's wind charts as the result of probabilities. From their very construction, they cannot pretend to be more (and we do not believe their author intended them to be more) than to represent the wind that has been most frequently met with in the various 2° squares of latitudes and longitudes in which they are placed, and consequently the most likely wind to be met with in these squares. Now this is far from saying that such winds are certainly to be met with in those squares; for how could he say that, when he shows by lines of proportionate length, the various *other* winds that have also been met with in the same squares. These seem to be the "streaks of ill-luck" alluded to. He has also specified the

limits of the calms or doldrums *between* the trade-winds; at the four seasons of the year. Therefore to take Maury's charts, and to expect always to find the same most probable wind as he has marked it, is in fact to make a use of them for which they were not intended, and their author has thus been misrepresented. Again there can be no doubt that in such a conclusion even as that at which Maury has arrived,—this was obtained not only from a certain number of records of those winds according as the logs of ships were more or less numerous that passed through those squares, but the number of those ships were also far more numerous in some than in others, as ships might be expected to pass through some more than through others in making passages. And again the greatest number of observations exhibited by any one square would extend over a certain period of time only, that would be very insufficient from which to form a good trustworthy average of what would be the prevailing wind.

Such is the light in which we have always looked on Maury's wind charts, and we may ourselves confess to a similarity of views as those with which Maury set to work, long before he visited the Hydrographic Office in London about forty years ago. We long had entertained the opinion that in any part of the Ocean, certain winds were more common than others at certain times of the year; and that it was highly to be desired, that, for the assistance of the mariner, he should be told of them. And we had made some progress with our method, but other duties came in the way. Such a scheme was not appreciated in this country, while Maury's plan was taken up and the result was perhaps too hastily brought out. The average was not spread over a sufficient number of years to be entitled to confidence, and here is the result.

And yet how dangerous must be such conclusions even from far more numerous observations than he has taken, when those conclusions are to be considered the absolute winds which a ship is expected to meet in a particular part of the ocean. At best it is only the most probable wind, and the same difference of seasons that produced the other winds will do so again; not so likely to do so perhaps but well within the range of possibility of doing so. And therefore we say that any one who takes it for granted that he must meet with the wind that Maury has said he most probably will meet with, runs a good chance of being disappointed, as Captain Hoffmann has been. And navigators will do well in using those wind charts not to forget that at best they are but *chance charts* of information of a very *uncertain* kind. Still Capt. H. found them true *twice* out of *three times!*

Of late years we have heard great complaints about the trade winds, especially in the course of last year. Some previous years also have been remarkable for giving us S.W. winds where the N.E. trade was formerly regularly found, shewing how little we know on the subject of the causes which produce such changes in the usual course of Nature.

While on this subject, a correspondent asks us for information on the *cause of hurricanes!* It is but a few years ago that Redfield did

a service to his brother seamen by notifying to them in this journal, their revolving nature, so that our seamen should know how to deal with them. To establish the fact that they are alike, that is that those of each hemisphere (although they revolve in opposite directions) follow the laws of their own hemisphere, is a great step attained, and of the utmost importance to the navigator. Their occurrence at a particular season of the year points to the position of the sun having much to do with that cause, along with which electricity no doubt takes its share. But they have often reminded us of those lines of the Poet, for which subject they were certainly never intended. And yet how true are these lines even applied to the discord of the atmosphere that say—

> "Discord, dire sister of the slaught'ring power,
> Small at her birth, but rising every hour,
> While scarce the skies her horrid head can bound,
> She stalks on earth and shakes the world around."

And then, when the hurricane from its original small focus like Discord has spread in its fury and lashed the ocean to mingling with the skies over its area of many miles in extent, its strength is exhausted, its rage is over, and it leaves the scene of its visitation again in peace. When again,

> "But lovely Peace in angel form,
> Descending, quells the passing storm."

Yes, so it is with Nature as with Man. After a storm comes a calm: quietness again prevails, and the peaceful trade wind takes its usual course. But wherefore and whence comes all that small but swelling *Discord* to produce the hurricane, we shall leave others to say.—Ed.—*N.M.*

Preservation of Life from Shipwreck in 1867.

The Annual Meeting of the Royal National Life-boat Institution was held on March 10th, at the London Tavern. The Right Honourable H. T. L. Corry, M.P., First Lord of the Admiralty, took the chair on the occasion. He was supported by a large number of influential persons.

Amongst those present we observed—Rear Admiral Sir W. H. Hall, B.C.B.; Sir Edward Perrott, Bart.,; S. R. Graves, Esq., M.P.; Thomas Baring, Esq., M.P.; Captain The Honourable F. Maude, R.N.; Captain G. H. Richards, R.N., F.R.S., Hydrographer to the Admiralty; Rear-Admiral George Davies; Captain Becher, R.N., F.R.A.S.; Rev. E. Hewlett, M.A.; Rev. Brymer Belcher, M.A.; Captain McGregor, of the "Rob Roy"; Captain Henning, R.N.; Captain Arrow, Deputy Master of the Trinity House; Vice-Admiral Sir Thos. Hastings; Captain Littlehales, R.N.; Thos. Chapman, Esq., F.R.S.; Alexander Boetefeur, Esq.; Vice-Admiral Smart; K. D. Hodgson, Esq.; Vice-Admiral Evans; B. L. Judkins, Esq.; Captain R. Robertson, R.N., Surveyor-General of the Board of Trade; Captain Tribe, R.N.; Captain Symons, R.N.; Ebsworth England, Esq.;

Major-General Moore; Colonel FitzRoy Clayton; Vice-Admiral Gordon; George Lyall, Esq.; Vice-Admiral McHardy; C. Brown, Esq.; Captain Peacock; G. C. Begbie, Esq.; J. G. Frith, Esq.; C. R. Fenwick, Esq.; Rear-Admiral G. A. Halstead.

We were much gratified with the admirable and appropriate remarks of the First Lord of the Admiralty. He first observed that he was very sensible of the honour which had been done him in asking him to preside at this annual meeting of the Life-boat Institution, which was as national in its character as it was beneficent in its object. The services of this Society could not be over-rated, especially in a great naval country like England. Last year it was instrumental in saving as many as 1,086 lives. Of this number 783 were saved by the life-boats under its immediate charge, without the loss of a single life to any of the brave men who had formed the crews of the life-boats. He also learned with the greatest satisfaction that since 1824, when the Institution was first established, within a fraction of 13, 17,000 lives had been saved by its means. This fact was strikingly presented to his mind from the knowledge he had in consequence of his official position, that this total of 17,000 persons was within a fraction the whole number of bonâ fide seamen at present serving on board Her Majesty's fleet. Its operations were not merely local, or even national. It was very pleasant to find that sailors who served under all flags, when in danger from shipwrecks on our coasts participated in the benefits of the life-boats. The services of this Society were appreciated nearly as highly in foreign countries as at home. They saw this from the fact that, at the late Exhibition in Paris, the International Commissioners conferred upon it the highest prize of honour. This was a recognition and tribute in the shape of the largest gold medal to the humanity of this country, which he thought was as honourable to those who gave as to those who received. The report showed how great was the favour in which the Society was held in its own country.

The magnitude of the Society's operations appeared from the statement that it had under its charge nearly 200 life-boats. He could not refrain from paying a tribute to the bravery of the men who formed the crews of the boats, and from expressing the hope that the Society might long continue to enjoy its present public favour, and might not only maintain its efforts, but extend its sphere of usefulness.

Mr. Corry's remarks were thoroughly appreciated by the meeting.

Annual Report.

On this the forty-fourth anniversary of the Institution the Committee returned their hearty thanks for the moral and pecuniary support extended to them, and they desired also publicly to express their gratitude for the blessing which Divine Providence bestows on their labours.

As Mr. Corry had observed, the Institution had during the year received a gratifying International recognition of its importance and of the perfection of its working machinery, in the award of the

"*Grand Prix d' Honneur*" (the largest Gold Medal) conferred on it by the Imperial Commission of the Universal Exhibition held at Paris, where it exhibited a full-sized first-class life-boat, with transporting-carriage, and equipment complete.

On the closing of that important Exhibition, the Committee, desirous of offering a tangible expression of their sympathy with the Life-boat Society of France, "La Société Central de Sauvetage des Naufrages," which had been founded and organised on the principles of the English Life-boat Institution, and believing that such a mark of their esteem for their sister Society would be accepted as a graceful International compliment, resolved on presenting to it the life-boat and equipment above referred to. The French Society expressed its high appreciation of the gift, and stationed the boat at Calais, the principal port of intercommunication between the two countries.

We some time since noticed in this Magazine that the improved safety fishing-boats of the Institution had been placed on the coast during the last year, and that they had given great satisfaction to their crews. In Scotland some of the local fishermen were improving their own boats in imitation of them. The character of these boats had excited considerable attention; and the Institution had consequently received several inquiries respecting them from foreign countries, as well as from various parts of our own coast, a gratifying acknowledgment of the importance of this movement initiated by the Institution.

It appeared that twenty-seven life-boats had been built by the Institution during the past year. All had been the special gifts of public bodies or of private individuals. They are stationed as follows:

ENGLAND.

NORTHUMBERLAND—Holy Island, No. 2.
DURHAM—Seaton Carew.
NORFOLK—Hunstanton.
" Caister.
SUFFOLK—Kessingland.
KENT—Broadstairs.
SUSSEX—Newhaven.
ISLE OF WIGHT—Bembridge.
" " Brooke.
DEVONSHIRE—Exmouth.
CORNWALL—Cadgwith.
" Mullion.
CHESHIRE—New Brighton.
CUMBERLAND—Silloth.
ISLE OF MAN—Douglas.

WALES.

ANGLESEY—Bull Bay.
CARNARVONSHIRE—Llandudno.
FLINTSHIRE—Abergele.

SCOTLAND.

AYRSHIRE—Ayr.
KINCARDINESHIRE—Stonehaven.
FORFARSHIRE—Buddon Ness.
" " Broughty Ferry.
HADDINGTONSHIRE—North Berwick.

IRELAND.

Co. DOWN—Groomsport.
LOUTH—Dundalk.
DUBLIN—Kingstown.
CORK—Youghal.

Transporting carriages, when required had been provided, and boat-houses at all the new stations.

The Life-boats of the Institution now number one hundred and eighty-six. They had been the means of saving no less than *seven hundred and eighty-three* lives during the past twelve months—nearly the whole of them under circumstances in which they could not have been saved by any ordinary description of boat.

It was truly gratifying to find that these valuable services had been performed without the loss of a single life on the part of the brave men who had formed the crews of the boats, notwithstanding that the boats were afloat on actual service two hundred times, and manned by 2,500 men.

What is this life-boat work thus succinctly referred to. Let us try to describe it. When the mercury falls, or the scud flows thick and fast, the coxswain of each boat looks to her, and sees that all is in the proper place and ready. A gun is heard booming over the roar of the storm, a blue light reveals for a moment the gloomy cliffs; the breakers and the peril of the ship are enough to make him doubly anxious. The whole village is now upon the beach, clergymen, gentry, physicians, seamen, insensible to the storm or rain. Under the shelter of the pier or boat-house the women flock together. They know that husbands, sons, and brothers will go out, and that a life-boat's crew is not always safe. While the sea tears up the beach, and rattles a deluge of stones and sea-wrack up the village street, the boatmen launch the life-boat. Volunteers of all grades are not wanting. No man thinks of peril when seamen and passengers are in the jaws of death. The great difficulty is to get the boat once clear from shore. She is pushed out perhaps with all her crew on board. Men who could tell of many a danger shared together. Three, four, five times the boat may be driven back, but the sea shall be mastered. The men are careless of hurts or bruises. If one be disabled there are twenty to fill his place, and even women claim to pull an oar with their husbands or their lovers. They all know the story of Grace Darling. But the men *will* go, married or single, old or young. If possible the life-boat is placed under the lee of the ship in danger, while the wrecked men drop one by one into the arms of the rescuers, or trust themselves to the waves. Not seldom are both crew and passengers powerless, through cold or exhaustion, to do anything to save themselves, like that Algerine sailor, in the wreck of the *Oasis* a few weeks since, who could not even speak, and lay for twenty-four hours on the deck after the rest of the crew had been taken off by the Cambridge University Boat Club life-boat, stationed at Tramore. But some two or three of the life-boat's crew climb up by broken cordage, or the shattered figure-head, and let the lifeless or the wounded gently down. Not till the last man is in do they return to shore. Often the boat, just as it nears the beach, is sucked back by the waves. Often the oarsmen pull as if through a solid mass of sea above and below. They watch for the coming of a billow on whose crest they may be borne in. There are a hundred eager hands ready to seize the boat and keep her steady and safe from the back-wash of the waves. But the deep is treacherous, and villages on the coast have had cause to mourn not seldom, when, as if indignant at the rescue of its prey, the sea overturns the life-boat just as all seemed safe, and grinds to death the rescuer and the rescued.

Notwithstanding what Mr. Cave, M.P., Vice-President of the Board of Trade, said last November in the House of Commons, we are told that the Wreck Register for the year 1867 is not yet made

up, and the number of shipwrecks and the loss of life during that period cannot therefore be stated at the present time. There can be no doubt, however, that the past year has formed no exception as regards the frequent shipping disasters that annually take place on our coasts. Occasionally it had almost appeared as if the tornadoes that proved so destructive in the West Indies had travelled north, as is often the case with them, and found their way to the British Isles. On these occasions noble work is usually performed by the Life-boats of the Institution, in many instances by the crews of open boats, and by the Rocket Apparatus, (now admirably managed by the Coastguard under the control of the Board of Trade).

The character of these storms and Life-boat services may be judged of by the fact, that during the gales of November and December last no less than two hundred and fifty-nine shipwrecked sailors were saved by the Life-boats of the Institution, as we showed in our January number.

These gallant services have varied much in character: many have been accomplished during the dark hours of night, others have been by day; some at short distances from the shore, others on outlying banks far from the land. In some cases greater danger has been incurred than in others. In some, men have been washed overboard from the boats, but recovered again.

These life-boat men, by giving their invaluable aid, performed their full share of the duty of alleviating and reducing the amount of the misery and evil produced by the storms on our coasts. It remains then for those who cannot share the risks and exposure which these brave men incur, and who knows how many times these were endured amongst the great work detailed below, to perform their part in this humane work, by enabling the Institution to provide the life-boats' crews with every means of safety and efficiency, and to remunerate them sufficiently—thus serving as some encouragement to them in the risks, labour, and exposure which they undergo.

The Life-boats of the Institution were instrumental in saving, in 1867, the Crews of the following wrecked vessels:—

Schooner *Mary Tatham*, of Chester 4
Brig *Chase*, of Shields 5
Schooner *Mizpah*, of Dartmouth .. 8
Barque *Aurora Borealis*, of Rebe.. 10
Sloop *Oliver Lloyd*, of Cardigan .. 3
Smack *Turtle Dove*, of Aberystwith 3
Brig *Emanuel Boucher*, of Whitby 6
Smack *Coronation*, of Bideford.... 4
Schooner *Teazer*, of Ipswich 1
Sloop *Shamrock*, of Liverpool 3
French Schooner *Anemone* 5
Schooner *Gem*, of Hull 2
Brigantine *Seraphin*, of Dunkirk .. 8
Lugger *Espoir*, of Nantes 6
Schooner *Salome*, of Brixham 6
Schooner *Selina Ann*, of Looe 5
Schooner *Heiress*, of Teignmouth.. 6
Ship *John Gray*, of Glasgow 13
Brig *Antares*, of Grieffswald 1
Schooner *Jeanne d'Arc*, of Nantes —Saved vessel and crew 5
Smack *Catherina*, of Barmouth— Saved vessel and crew 4
Smack *Noah*, of Cardigan 2
Schooner *The Clyde*, of Great Yarmouth 5
Schooner *Jane Ellen*, of Aberystwith —Saved vessel and crew 5
Brig *Anne*, of Milford—Assisted to save vessel and crew 8
Barque *Marie Amelie*, of Quimper— Assisted to save vessel and crew 14

Brig *Benton*, of South Shields 6
Brig *Mary*, of Sunderland—Assisted to save vessel and crew 8
Sloop *Perseverance*, of Liverpool .. 2
Barque *Chowdean*, of Sunderland—Assisted to save vessel and crew 10
Sloop *Emma*, of Portsmouth—Saved vessel and crew 3
Sloop *Telegraph*, of Sunderland.... 3
Barque *Coquimbo*, of Sunderland .. 15
Ship *Cameronian*, of Liverpool—Saved vessel and crew 20
Brigantine *Eclipse*, of Londonderry 1
Schooner *Gratitude*, of Aberystwith 4
Smack *Striver*, of Great Yarmouth—Saved vessel and crew 5
Schooner *The Squire*, of Great Yarmouth 4
Brig *Sarah Ann*, of Jersey 6
Schooner *Mary Lewis*, of Aberystwith 5
Schooner *Devonia*, of Padstow 5
Barque *Loretto*, of Liverpool—Assisted to save vessel and crew.. 14
Barque *Centurion* 18
Barque *Wild Horse*, of Windsor, N.S. 10
Schooner *Mary*, of Dublin 3
Brig *Harmony*, of Bideford 3
Schooner *La Prudence*, of Algiers.. 6
Sloop *William*, of Paimpol 6
Austrian Schooner *Nicolo* 14
Prussian Schooner *Louise*—Assisted to save vessel and crew 7
Brigantine *Estella*, of Preston—Saved vessel.
Barque *A. L. Routh*, of New York—Saved vessel and crew 16
Schooner *Glyde*, of Killough..... 5
Barque *Susan L. Campbell*, of Weymouth, N.S. 14
Ship *Nor' Wester*, of Boston, U.S. 5
Brig *Wellington*, of Aberystwith—Assisted to save vessel and crew.. 9
Brig *Mary*, of Workington—Rendered assistance.
Schooner *Mary*, of Lynn—Rendered assistance.
Smack *Choice*, of Hull 3
Brig *Wild Rose*, of Brixham—Remained by vessel.
Schooner *Hero*, of Maldon 3
Schooner *Phœbe*, of Goole 2
Brig *Queen Victoria*, of South Shields 1
Sloop *Christian and Charlotte*, of Peterhead 4
Ship *Thornton*, of New York 13
Schooner *Jane Sophia*, of Aberystwith—Saved vessel and crew.... 5
Smack *Telegraph*, of Port Isaac .. 3
Barque *Strathleven*, of Glasgow .. 15
Fishing-smack, of Holy Island—Saved vessel and crew 4
Brig *Ayrshire Lass*, of Androssan—Saved vessel and crew 4
Royal Mail Steamer *Leinster*—Rendered assistance.
Schooner *New Whim*, of Portsmouth 3
Brig *Amicizia*, of Genoa 14
Ship *Blanche Moore*, of Liverpool.. 36
Brig *Spey*, of Jersey—Remained by vessel.
Brigantine *Union*, of Cowes 7
Brig *William and Sarah*, of South Shields—Vessel saved.
Schooner *Hope*, of Beaumaris—Saved vessel and crew 3
Smack *Robert Hudson*, of Arklow.. 4
Schooner *Splendid*, of Dublin—Saved vessel and crew 6
Smack *Kate and Mary*, of Arklow—Saved vessel 1
Smack *Jane*, of Carnarvon—Assisted to save vessel and crew 4
Seven Fishing Boats, belonging to North Sunderland, Newton, and Craster—Assisted to save vessels and crews 30
Brigantine *Sybil*, of Yarmouth 4
Schooner *Commot*, of Whitby 4
Fishing-boat of Newbiggin—Rendered assistance.
Barque *Achilles*, of Glasgow 3
Barque *James Campbell*, of Shelburne, N.S. 11
Ship *Michiels Loos*, of Antwerp—Rendered assistance.
Brig *Ruth*, of London 9
Smack *Margaret Davies*, of Girvan 3
Newarp Light Ship—Rendered assistance.
Smack *Queen Victoria*, of Brixham—Saved vessel and crew 2
Barque *Lord Collingwood*, of Newcastle—Remained by vessel all night.
Brigantine *Medora*, of Great Yarmouth 2
Brig *Bessie*, of Sunderland—Rendered assistance.
Barque *Thetis*, of Gothenburg 16
Brig *Marie*, of Grieffswald 11
Brig *Contest*, of Guernsey 46
Smack *Plowman*, of Great Yarmouth—Saved vessel and crew.. 7
Norwegian schooner *Polydesa*—Saved vessel and crew 5
Cadgwith Fishing-boats—Assistance rendered.
Brig *George*, of Sunderland 1
Schooner *Restless*, of Peterhead .. 6

Schooner *Remedy*, of Whitstable—Remained by vessel.
S.S. *Harmonia*, of Hamburgh 15
Ship *Clarinda*, of Sunderland 7
Schooner *Assistant*, of Stavanger—Remained by vessel.
Schooner *Dunkerquoise*, of Dunkirk Rendered assistance.
Brigantine *Amor*, of Elsfleth 8
Brig *Cruiser*, of Hartlepool—Vessel and crew saved 6
Brig *Jenny*, of Whitby 6
Schooner *Woolgast*, of Woolgast, Prussia—Rendered assistance.
Ship *Lydia Williams*, of Liverpool 34
Barque *Bayadere*, of Rouen 12
Schooner *Elizabeth*, of Liverpool .. 7
Schooner *St. Brannock*, of Bideford—Rendered assistance.
Brigantine *Vitruvius*, of Liverpool 6
Sloop *Ant*, of Boston 2
Schooner *Elizabeth*, of Louth 1
French brig *Courrier du Nord* 1
Sloop *Hellena*, of Alloa 4
Schooner *Esk*, of Montrose 6
Ship *Annie Gray*—Remained by vessel.
Brig *John*, of Hartlepool 1
The *Naiad*, of Colchester—Rendered assistance.
Smack *Hope*, of Aberystwith—Saved vessel and crew 3

Total Lives saved in 1867 by Life-boats 783
During the same period the Institution has granted rewards for saving lives by fishing and other boats 303

Grand Total 1086

General Summary for 1867.

			£	s.	d.
Number of Lives rescued by Life-boats, in addition to 35 vessels saved by them	..	783		..	
Number of Lives saved by Shore-boats, etc. ..	..	303		..	
Amount of Pecuniary Rewards for Saving Life during the Year	..	..	3,189	2	8
Honorary Rewards: Gold and Silver Medals ..	13	..		..	
Votes of Thanks on Vellum and Parchment ..	13	..		..	
Total	26	1,086	£3,189	2	8

Fostered by the National Life-boat Institution, there can be no doubt that the effort to save life from shipwreck forms one of the most heroic characteristics of the age in which we live—exciting the admiration of the world at large; and, happily, it is not limited to our boatmen and fishermen, but is shared by all classes of society.

Who can forget the recent noble services performed by the Rev. Charles Cobb, M.A., of Dymchurch, Kent. It will be remembered that they were rendered on a Sunday morning, and on the first intelligence of the disaster reaching him he and his congregation were at church. Immediately they rushed down to the beach, and when others were hesitating he and John Batist, a coastguardsman, plunged into the raging surf, and at the imminent peril of their lives saved one of the crew who had taken refuge in the rigging of the lugger *Courrier de Dieppe*, of Dieppe, which was wrecked off that place on the 6th January, 1867. Mr. Cobb has received the Albert Medal, the Gold Medal of the Royal National Life-boat Institution, and other acknowledgments of his noble and daring deed. The Life-boat Institution also presented their Silver Medal to the coastguardsman, who so bravely helped Mr. Cobb on the occasion.

In addition to the 783 lives and thirty-five vessels saved exclusively by the life-boats of the Institution, 303 lives were saved last year by fishing-boats and other means. This gratifying fact may be attributed in a large extent to the liberal and prompt rewards given to all persons who are instrumental in saving life from shipwreck on our coasts.

The number of lives saved during the forty-four years from the establishment of the Institution in 1824, to the end of the year 1867, either by its life-boats, or by special exertions for which it has granted rewards, is as follows :—

In the Year.	No. of Lives Saved.	In the Year.	No. of Lives Saved.	In the Year.	No. of Lives Saved.
1824 ..	124	1840 ..	353	1856 ..	473
1825 ..	218	1841 ..	128	1857 ..	374
1826 ..	175	1842 ..	276	1858 ..	427
1827 ..	163	1843 ..	236	1859 ..	499
1828 ..	301	1844 ..	193	1860 ..	455
1829 ..	463	1845 ..	235	1861 ..	424
1830 ..	372	1846 ..	134	1862 ..	574
1831 ..	287	1847 ..	157	1863 ..	714
1832 ..	310	1848 ..	123	1864 ..	698
1833 ..	449	1849 ..	209	1865 ..	714
1834 ..	214	1850 ..	470	1866 ..	921
1835 ..	364	1851 ..	230	1867 ..	1,086
1836 ..	225	1852 ..	773		
1837 ..	272	1853 ..	678	Total ..	16,987
1838 ..	456	1854 ..	355		
1839 ..	279	1855 ..	406		

Language can hardly convey an adequate impression of the good work that has thus been accomplished by the Institution, which is gradually extending its sphere of operations, and, as a natural result, is able to report with thankfulness a larger number of lives saved last year than in any previous corresponding period.

During the past year, one Gold Medal, twelve Silver Medals, thirteen Votes of Thanks inscribed on vellum and parchment, and £3,189 granted for saving the lives of 1,086 persons by life-boats, shore and fishing-boats, and other means, on the coasts and outlying banks of the United Kingdom.

All over the coasts—extending upwards of 5,000 miles—our boatmen and fishermen are now fully impressed with the fact that any laudable service on their part to save, or attempt to save life from shipwreck, will be promptly and liberally rewarded according to the risk and exposure incurred in the service.

The Institution continues to receive the prompt and cordial co-operation of their active colleague, Commodore J. W. Tarleton, R.N., C.B., Controller General; also of Capt. G. Wodehouse, R.N., Deputy Controller-General, and of the Officers and men of the Coastguard Service, to whom the best thanks of the Institution were tendered.

The Society had expended on life-boat establishments £197,000, and voted eighty-three Gold and 784 Silver Medals for saving life, and pecuniary rewards to the amount of £27,313.

The Institution continued to receive the kind co-operation of the Local Branch Committees, which constitute so important a portion of the machinery of the Institution for the supervision of its several Life-boat establishments, and of the valuable and gratuitous services of the zealous Honorary Secretaries of those Committees.

Finances.—The total amount of receipts during the year 1867 was a noble sum, it amounted to £39,305; and the Committee are grateful to be able again to announce, that of this sum no less than £12,299 were special gifts to defray the cost of 25 Life-boats:—

We must give this magnificent list, which is as follows:—

	£	s.	d.
Holy Island, No. 2—J. G. Frith, Esq., and Mrs. Frith	420	0	0
Redcar—"Burton-on-Trent" Life-boat Fund, per M. T. Bass, Esq., M.P., A. O. Worthington, Esq., Mr. James Nichols, and others	628	0	10
Hunstanton—"Licensed Victualler" Life-boat Fund, per Thomas Winterbotham, Esq., Wm. Smalley, Esq., and James Wyld, Esq.	620	0	0
Cromer—Benjamin Bond Cabbell, Esq., F.R.S.	1,000	0	0
Winterton—The late Capt. E. W. Harris	420	0	0
Caister, No. 2.—"Routledge's Magazine for Boys" Life-boat Fund, per E. Routledge, Esq.	306	12	6
Kessingland—J. Hargreaves, Esq., of Broad Oak	500	0	0
Eastbourne and Newhaven—A Lady, per Mr. Benjamin Kerridge	1,000	0	0
Bembridge—"City of Worcester" Life-boat Fund, per Captain Saumarez Fraser, R.N.	524	3	6
Brooke—George Marten, Esq., and Miss Marten, in memory of Mrs. Marten	450	0	0
Cadgwith—"West of England Commercial Travellers'" Life-boat Fund, per Thomas Davies, Esq.	268	1	0
Mullion—"Daniel J. Draper" Life-boat Fund, per Rev. Luke H. Wiseman and Thomas Smith, Esq.	777	4	8
Stromness—Titus Salt, Esq.	620	0	0
Milford—Titus Salt, Jun., Esq.	420	0	0
Portmadoc—James Ashbury, Esq.	415	0	0
Bull Bay—A Lady in Wales	400	0	0
Rhyl—The Executors of the late Mrs. Elizabeth Morgan, per Miss Ellen Hodgson	650	0	0
Ayr—"Glasgow Workmen's" Life-boat Fund, per Mr. George Norval	350	0	0
Stonehaven—Mrs. George Burgess	420	0	0
Buddon Ness—A Lady, per W. Banting, Esq.	600	0	0
Groomsport—A Lady	420	0	0
Dunkalk—"Stockport Sunday School" Life-boat Fund, per James Leigh, Esq., J. Walthew, Esq., Captain Wilkinson, Joseph Leigh, Esq., and others	420	0	0
Youghal—"A Townsman of Leeds" (A. B.)	420	0	0
Courtmacsherry—"City of Dublin" Life-boat Fund, per Thomas Edmondson, Esq., the late W. J. Egan, Esq., and Mr. S. B. Taylor	250	0	0

Since the last Report the Institution had received many gratifying donations, amongst which we observe the following occur, the receipt of which the Committee gratefully acknowledge:—

£105 from H.R.H. THE PRINCE OF WALES; £40 from X.Y.Z.; £200 collected by Master HERBERT MARSTON, the blind son of the Rev. C. D.

MARSTON; £17 from the North London Life-boat Fund, per Mr. H. BILBE; £7 8s. from Penny Readings at All Saints', Dalston, per Mr. E. H. PANTON; £97 13s. 10d. from the Torbay Gale Fund, per J. KITSON, Esq.; £20 from the Sheerness Literary Institute, being proceeds of an entertainment given by the members; £17 from a dramatic entertainment, per Mr. R. FRANKLAND; £10 13s. 3d. collected by Mr. J. LUCEY, of Camberwell; £50 additional from the Bristol Histrionic Life-boat Fund, per E. AUSTIN, Esq.; £50 from the Trustees of the late THOMAS BOYS, Esq., of Hove, near Brighton, being two quarters' surplus income; £20 10s. being the Collection after a Sermon preached by Canon PARKER in the Encampment of the 3rd Bat. Lancashire Royal Volunteers, per Lieut.-Col. HARGREAVES; £22 16s. 4d. from the Officers and Passengers of the Cape Mail Steamers *Roman* and *Anglia*, on their voyages from the Cape, per their respective Commanders, Captain DIXON and Lieut. KER, R.N.R.; £10 11s. 3d. "First half-year's collection" by Sir W. R. CLAYTON, Bart.; £12 4s. from the Contribution Boxes on the South Devon Railway, through ALBERT P. PROWSE, Esq.; £8 10s. collected by JOHN TURNER TURNER, Esq., of the schooner yacht *Constance*; £15 from the Southport Penny Readings, through the Southport Branch of the Institution; £100 from WILLIAM BOTLEY, Esq., F.S.A.; £50 from Miss BURDETT COUTTS; £984 collected by Captain MONTAGUE PASCO, R.N.; £87 7s. 9d. collected from Seamen and others, by the Agents of the sister Institution, the Shipwrecked Fishermen and Mariners' Society; Portion of profits of Needham Market Fine Arts and Industrial Exhibition, per Rev. H. T. CURRY, £4 4s.; Proceeds of a Concert given by the "Covent Garden Snow-Drops," in the Polygraphic Hall, on 31st October, £23 10s.; Contents of Alms Boxes at St. Gabriel's, Pimlico, per Rev. B. BELCHER, M.A., £9 5s.; "One who thinks of Sailors on stormy nights," £10; A Sailor's Daughter, per Messrs. DRUMMOND, fifth donation, £100; A few gentlemen at the Castle Hotel, Bath, per W. H. BOND, Esq., £6; Amicus, £10 10s.; Wardroom Officers of H.M.S. *Valorous*, per Lieut. F. C. LAW, R.N., £2 8s.

Some handsome legacies have been bequeathed to the Institution during the past twelve months. We must give a list of them as this is a most desirable way of benefitting the Institution:—

	£	s.	d.
Charles Walker, Esq., Southport	100	0	0
Miss C. N. Oxenham, Kensington	200	0	0
Mrs. Mary Ann Smith, Greenwich	1000	0	0
William John Hall, Esq., Tower Hill	1000	0	0
Martin Lane, Esq., Cheltenham	10	0	0
Miss Mary Shortridge, Cleadon	50	0	0
E. Bagshaw, Esq., Nottingham	25	0	0
Miss Jane Sharpe, Whitburn	100	0	0
Robert Shepherd, Esq., Rochdale	1000	0	0
Miss Maria Irlam, Chester	1000	0	0
Mrs. S. D. Woodhouse, Grosvenor-street	100	0	0
Mrs. Maria Deane, Cheltenham	100	0	0
Mrs. M. Hooper, Andover	100	0	0
Robert Hewer, Esq., Morpeth	25	0	0
Miss Maria Rawson, Sheffield	100	0	0
Edward Weston, Esq., Leicester	19	19	0
Jacob Nathan, Esq., Plymouth	50	0	0
Thomas Rogers, Esq., Bonsall	300	0	0
David Sinclair, Esq., Thurso, N.B.	100	0	0
Miss Bolton, Chelsea (Stock)	500	0	0
Miss Sarah Harrison, Edge Hill	100	0	0

Now let us see how the Committee expend the large sum the public place at their disposal. We find that during the past year

£15,186 13s. were expended on additional Life-boats, transporting-carriages, boat-houses, and necessary gear; £8,017 on the expenses of repairs, painting, refitting, etc.; and £7,481 in rewards for services to shipwrecked crews, coxswains' salaries, and quarterly practice of the Life-boats' crews; £419 for a safety Fishing-boat and gear, etc.; making altogether, including liabilities amounting to £6,902 for Life-boat Stations now in course of formation, and other expenses, a total of £40,023. No one we should think can have one word to say in objection to this judicious expenditure. On the contrary, we think the public are deeply indebted to the Committee for the admirable manner they administer the funds of the Institution.

For a considerable saving in the item of transport to their stations of new Life-boats and carriages, the Committee have again to express their thanks to those Railway and Steam Packet Companies who had very liberally conveyed them to all parts of the United Kingdom free of charge.

We also observe, that the items of receipt and expenditure which are fully detailed in the financial statement annexed to the Report, were audited, as usual, by Mr. BEGBIE, the public Accountant. We have heard it stated that the accounts of the Institution are most accurately kept, and that its Auditor, although a public Accountant and receiving £21 for his audit, found not a single mistake in its books last year.

It is only reasonable to expect that in such a fleet of Life-boats as the Institution possesses, frequent damages will take place, in addition to the fact that boats will occasionally decay from natural causes.

On reviewing the great and national work recorded in this article, we feel assured that the Committee have every reason to take courage and be thankful; for we are persuaded that so long as the Life-boat service continues to elicit the admiration of a large portion of the discriminating British public, sympathy and support will be extended to it.

COLLISIONS OF STEAM VESSELS.

To the Editor of the Nautical Magazine.

SIR,—The importance of this subject, connected as it is with the shipping interest, must plead my apology for again troubling you with a communication.

In my former letters I endeavoured to point out the best positions for danger signals, also the evils resulting from the side signal lights, as now placed on board of steam vessels.

Considering that I was sufficiently explicit in my condemnation of the latter, to have called forth a reply from even its weakest advocates, but as their silence only adds to my strength, and is a further proof if

it were wanting, that my arguments are unanswerable, I am content to take my stand on that ground, and in the mean time submit the following for elucidation by those, who support the present system of lighting steam vessels.

First, If the existing side signal lights are considered sufficiently effective, how is it that collisions occur almost nightly, whereby lives and property are sacrificed to such an enormous extent, as witness the steamers *Amazon* and *Osprey*, *Bhima* and *Nada*, *Seagull* and *Swan*, with a host of others too numerous to detail, and too terrible to contemplate.

Secondly, Can it be denied that by the present system, it is virtually impossible for one steam vessel to know the point of the compass to which another steam vessel's head is, or may be directed, so long as their lights only are in view; or that on two steam vessels approaching from nearly opposite points, and being on each other's starboard bow, or vice versa, one (for example) steering east, the other steering west, although both are unconscious of the course being steered *(by the other)* within at least eight points, but each imagining the other to be nearly end on, the one is thus led to port her helm, in order to show her red light, altering the course, possibly six or more points to the southward (or as the case may be), thereby placing herself at nearly right angles with the other, *who previously in safety, is now in dangerous doubt.* The latter vessel seeing the red light, consequently ports her helm, and in attempting to bring her head to the northward (or as the case may be) to show her red light, a collision in all probability ensues.

This may be considered an extreme case, but it is nevertheless within the limit of the danger, which the present system of side signal lights is capable of producing. It may also be urged that it should not be attempted, but unfortunately it is too often the case that it is so, and instead of being placed against the want of judgment, should it not be carried to the account of a faulty system.

Thirdly, Will the impossibility (in most cases) be admitted of seeing either the masthead light, or the side signal lights from right ahead, when the steamer is under all square sail, with the wind right aft, and thence their uselessness on this account be allowed.

If further evidence be wanting to condemn the present system, is it not almost daily placed before us in the fact of the various important cases that come under official enquiry, and the unsatisfactory decisions that are arrived at, especially when both vessels are pronounced in fault, owing principally to the impossibility of defining the relative positions of each steam vessel before the collision, with the probable amount of doubtful or conflicting testimony, brought to bear on both sides. And as the side signal lights are little or no guide to assist the judgment, is not the hardship of such a decision the more severely felt when it has to be borne by the really innocent as well as those in fault.

Can the advocates of the present system forget, that the subject is of too momentous a character to be trifled with, and that it is impossible to make the rule of the road apply to the present inutility

of the lights, so as to prevent collisions when steam vessels are meeting from every point of the compass, and under all circumstances connected with wind and weather; whilst the terrible sacrifice of life it occasions, must be the only result they can ever expect, so long as they plead its use.

In further illustrating my plan, I must again assert that I have no interest to serve, save that of preventing loss of life by collisions; and knowing full well the difficulties which I have to meet, I should not have entered the arena of public discussion, did I not feel satisfied that truth is on my side, and the support it must therefore ultimately receive from a discriminating public, especially of nautical men.

Firstly, In fixing my two lights red and green forward, both before the foremast, at an elevation of twelve and sixteen feet respectively, above the line of the forecastle deck, and twenty-five feet or more apart, in a fore and aft line with the keel, visible from five points abaft the beam, with the stern red light exhibited (when necessary) at an elevation of twelve feet above the taffrail (at centre), I submit, that in the most marked acceptation of the term, they would form an unerring guide.

Secondly, That it would be next to impossible for steam vessels to come into collision, carrying lights in these positions. As for example when two steam vessels are meeting end on, and supposing the first observer to alter his course even one point, it would INSTANTANEOUSLY show the other his or her relative positions by the movement, and thereby prevent the possibility of such a catastrophe.

Thirdly, That the three lights showing the extremes of the hull, *or limit of the danger, would be points from which the real bearing, and position of each steam vessel's head, could be instantaneously ascertained.*

Fourthly, That my system would be a faithful witness in a court of enquiry, against any attempt at falsehood, and no amount of hard swearing could ignore the fact, that the vessel which was run into, must have had her lights open, and therefore could not be in fault.

Fifthly, That on steam vessels approaching from any point, if at first sight it is seen that the other's lights are open, it is simply impossible for her to injure the observer. Under such circumstances the course to pursue would be perfectly clear.

In a word, my plan is so simple, that nothing short *of a wilful dereliction of duty*, would cause a collision, when carrying danger signals as herein set forth, for the prevention of which it is the most perfect safeguard ever brought under public notice, and which the supporters of the present system cannot disprove.

Yours faithfully,

N. HECKFORD,

Late Surveyor of Shipping, Port of Calcutta.

Forest Gate, Essex,
25th February, 1868.

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 171.)

Name.	Place.	Position.	F. or Fl.	Ht. in Ft.	Dist seen Mls	Remarks, Bearings are by Compass.
14. Schelde R.	Alterations	... ...	...	...	...	See Notice No. 14.
15. Singapore Rock.	Strait Tsugar	Japan	...	...	...	See Notice No. 15.
16. Temporary	Lights in	Red Sea	...	...	...	See Notice No. 16.
17. Fog Signal	Point des Monts	St. Lawrence	...	...	...	See Notice No. 17.
18. Bunt Head	Buoy Downs	England East Coast	...	...	...	See Notice No. 18.
19. Carmarque	Rhone R.	France South Coast	F.	38	9	Established 1st February, 1868. Additional at Mouth
St. Vincent	Mole Head	Naples, Italy	...	46	2	Moved further out. Green light.
Port Corsini	Mole Head	Italy	F.	24	6	Established 22nd January, 1868, removed to S.E.
20. Delamara	Malta	... ...	...	...	...	Discontinued for alterations.
21. Dragör Light vessel	Sound S. Entrance	Baltic	R.	31	10	Altered from a fixed Light on 1st May. See Notice No. 21.
22. St. Malo	N. Coast	France	...	...	...	
Grand Jardin	S. Extreme	... ...	F.fl.	65	12	Est. 15th April, 1868. } See Notice
Roche Bonne	East of St. Malo	... ...	F.	128	15	Ditto. Red. } 22 for particulars
Sablons	... ...	... ...	F.	41	7	Ditto. Green. } and
Ballua height	... ...	... ...	F.	221	9	Ditto. Green. } Directions
St. Juan de Luz	W. Coast	... ...	F.	...	...	Established 1st March, 1868, on Jetty Head.
23. Bristol Channel	Buoys altered	... ...	...	...	...	See Notice No. 23.
24. Cochin	Malabar C.	Hindostan	F.	95	14	Established 15th January. 1868. See Notice No. 24.
25. Berbice R.	B. Guiana	West Indies	F.	...	10	Position changed. See No. 25.
26. Cape St. Mary.	Bay of Fundy	44° 5′ N. 66° 10′·5 W.	R.	100	...	Established 1st April, 1868. A Red and White alternately thirty seconds each.
Mosher Island	La Have R. Entrance	Nova Scotia	F.	55	...	Ditto.
Pegy's Point	St. Margaret Bay	Ditto	F.	65	...	Ditto. A Red Light.
Pomquet I.	St. George Bay	Ditto	F.	50	...	Ditto. Red Light on East end of Island.
Carribon I.	Northumberland Strait	Ditto	R.	35	...	Ditto. Once a minute N.E. end of Island.
Black Rock Point	Cass Breton Island	Ditto	F.	45	...	Ditto. S. side of Entrance to Big Bras d'Or.
27. Eider River	Slesvig Holstein	North Sea	?	35	...	Established in *Spring* of 1868. A Light Vessel.

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

No. 14.—*Alteration of Lights in the Wieling Channel of the Schelde River.*—Notice by the Belgian Government states, that, during the month of January, 1868, the following alterations of lights in the Wieling channel would take place:—1. Lt. V. near Paademarkt bank removed. 2. Temporary light on point Nieuwe Sluis discontinued. 3. A Lt. V., in lieu of the Paademarkt Lt. V., is placed near the black buoy No. 2, in 4¾ fms. in line with the towns of Lissewege and Bruges, shewing a *red flashing* light, 39 feet above the sea, and in clear weather seen from a distance of 9 miles. The vessel *red* with the word *Wielingen* on both sides; during the day two distinguishing pyramidal truncated cones will be hoisted below the lantern. In fog a bell is sounded on board. 4. Two *fixed* white lights W. by N. and E. by S. of each other, distant 1,110 yards, will be established on the shore at Nieuwe Sluis. The east light is 83 feet above high water, and seen from a distance of 16 miles, from between the bearings S.E. by E. ⅔ E. and E. ¼ N. The west light is 43 feet above high water, and seen 13 miles from between the bearings W. ¼ S., round by South to E. ¼ N. 5. A *fixed red* light will also be shewn on the shore about 2,730 yards from the West Nieuwe Sluis light, 26 feet above ordinary high water, and should be seen 4 miles off between the bearings S.W. ¾ S. and W. by S.

Directions.—In entering the Wieling channel, after passing the floating light, the two white lights of the Nieuwe Sluis may be kept in line until the red light is seen, which light clears the Cadsand and Hompels banks.

All Bearings are Magnetic. Variation at 18½° *Westerly in* 1866.

No. 15.—JAPAN—NORTH COAST OF NIPON.—With reference to Notice No. 84 (January number p. 47), respecting a sunken rock lying off Toriwi-saki in the Strait of Tsugar, the rock believed to be the *Singapore rock* was found to lie N. 20° E. (N. by E. ¾ E.), distant one and a quarter miles from the centre of Low Island.

It is situated near the extreme of a sunken bank extending from Low island, has 6 or 7 feet water over it at low water spring tides, and is only from 9 to 12 feet in extent: the soundings round it vary from 13 to 21 fathoms at the distance of half a cable, excepting in the direction of Low island.

The soundings along the ledge between the rock and Low island, vary from 6 to 17 fathoms.

Caution.—The rock is surrounded to a considerable distance by the most conspicuous of the overfalls and ripples existing in the vicinity, all of which should be carefully avoided.

The channel between Toriwi-saki and Low island is unsafe for vessels and scarcely safe for boats.

All Bearings are Magnetic. Variation 2° 40′ *Westerly in* 1868.

No. 16.—RED SEA—WEST COAST.—*Temporary Lights and Buoys* to facilitate the navigation between Perim island and Ansley bay:—

A light vessel near seven fathoms patch (painted red with a black ball at the mast head), is one mile and a half S. by E. from the seven fathoms patch, in southern Chart of Red Sea, No. 8, in lat. 14° 53½′ N., long. 41° 9′ East. A *fixed* white light appears at her fore-yard, 30 feet above the sea, visible from a distance of 9 miles. Adjuce island lighthouse bears N.W. by W. ¾ W., distant 55 miles from the light vessel.

Red Buoy with pole near Ras Shucklis, lies in 10 fathoms water off the extreme point of a dangerous spit N.W. five miles from Ras Shucklis;

and bears S. ¼ W. (S. 4° W.), 14 miles from the light vessel. Ships should on no account pass inside this buoy as there is three fathoms water a quarter of a mile within it.

Red Buoy with red flag on Shoal north-westward of the light vessel in five fathoms water is on a shoal in lat. 14° 59·3′ N., long. 41° 4′ E.; bears from the light vessel N.W. ¼ N. (N. 40° W.), 6½ miles. There is 3½ fathoms water E.S.E., a quarter of a mile from the buoy.

Fixed light on Adjuce Island.—A fixed white light from a scaffold light-house on the east end of this island is 60 feet above the level of the sea, and in clear weather should be seen from a distance of 14 miles. The position of the light is in lat. 15° 14·5′ N., long. 40° 11·5′ E., and Assarka light bears N.W. (N. 43° 40′ W.) 26¾ miles from it.

Directions—Good anchorage for vessels on the north side of Adjuce island about three-quarters of a mile off shore, in 10 to 12 fathoms.

Fixed light on eastern Assarka Island, from a scaffold lighthouse on the centre of the island 39 feet above the sea, and should be visible 12 miles off. The position of the light is in lat. 15° 31′ N., long. 39° 51·7′ E.

Directions.—Vessels may pass either to the northward or southward of the light. Good anchorage in 12 fathoms midway between the two islands. A reef is about a mile S.E. Assarka island.

Red Buoy with balls between Hotha and Hurtow points, off the north extreme of a shoal between Hotha and Hurtow points, bears from Hotha point N.E. by E. ½ E., nearly one and a half miles. No danger to the northward of it.

NOTE.—The Latitudes and Longitudes herein, sometimes differ from those shown on the Chart.

Bearings are Magnetic. Variation 4° *Westerly in* 1868.

No. 17.—ST. LAWRENCE RIVER.—*Fog and Snow-storm Signal at Point des Monts.*—The Trinity House, Quebec, says that a 9-pounder signal gun has been placed near the lighthouse at Point des Monts in the River St. Lawrence, which, from the 1st April to the 15th December, during fogs and snow storms, will be fired every hour.

No. 18.—*Downs—Alteration in Position of the Bunt Head Buoy.*—The Trinity House, London, says the Bunt Head buoy has been moved to the southward, and now lies in 5½ fathoms at low-water springs, with the following marks and bearings, viz.:—

Upper Deal Mill, its width open to the southward of St. Saviour's Church ..	West.
Ramsgate pier lighthouse in a line with St. George's Church, Ramsgate ..	N. ¼ E., northerly.
Gull light vessel	N.N.E. ¼ E., $2\frac{3}{10}$ miles.
South Brake buoy	N. ¾ W., $1\frac{4}{10}$ miles.
South Sand Head light vessel	S.S.W. $3\frac{7}{10}$ miles.

All Bearings are Magnetic. Variation 20° *Westerly in* 1868.

No. 21.—BALTIC ENTRANCES—THE SOUND.—*Alteration in the Drogden, or Dragör Floating Light.*—The position of the light vessel is in lat. 55° 33½′ N., long. 12° 43¼′ East of Greenwich. The alteration is intended to distinguish the light exhibited from the light vessel from the lights of the surrounding shipping.

No. 22.—FRANCE—NORTH COAST.—*Lights at St. Malo.*—The following lights are for entering port St. Malo at night, by the Chenal de la Grande Porte.

Fixed light on Grand Jardin.—A *fixed white* light, showing a *red* and *green* flash, of about *two seconds* duration each, alternately *every twenty seconds.* The intensity of the white light will be considerably reduced when seen from the southward, between the points Décollé and Dinard, or from between the bearings N.E. by E., to N. by W. ½ W. The tower stands in lat. 48° 40½′ N., long. 2° 5′ W.

Fixed red light at Roche Bonne.—Bears E. by S. ¾ S. rather more than 4 1/10 miles. The light is a *fixed red* light, visible from between the bearings E. by S. ¼ S. and S.E. by E. ¾ E. (S. 66° E.) or 5 degrees on each side of the line of the two lights, is 128 feet above high water. The tower stands in lat. 48° 40·3′ N., long. 1° 58·8′ W.

Fixed green light at Sablons.—From the upper story of a house at the bottom of the Anse de Sablon. The light is a *fixed green* light, visible from between the bearings S.S.E. (S. 21° E.) and S.E. ¼ S. (S. 41° E.) The lantern from which the light is exhibited is placed in the upper story of a square white house, and is in lat. 48° 38·2′ N., and 2° 38·4′ W.

Fixed green light at Ballue.—From a lighthouse on the heights of Ballue, bearing S.S.E. ¾ E. (S. 31° E.), 1804 yards from Sablons light. Visible from between the bearings S.S.E. and S.E. ¼ S. The tower is in lat. 48° 37·6′ N., long. 2° 0·3′ W.

Directions.—To enter St. Malo port by night, the lights of Grande Jardin and Roche Bonne should be brought exactly in a line, bearing E. by S. ¾ S., and kept so until the green lights of Sablons and Ballue are in a line, bearing S.S.E. ¾ E., then these latter lights kept in line will lead in to abreast the white light on the mole of Noirs. Ballue light will be lost sight of behind the buildings of Saint Servan when about abreast the clock tower of St. Malo, but at that point there can be no uncertainty or difficulty in entering the port.

All Bearings are Magnetic. Variation 20½° *Westerly in* 1868.

No. 23.—BRISTOL CHANNEL.—*Addition and Alteration of Buoys, etc.*—The Trinity House, London, gives Notice, that in the month of April next the following additional buoys will be placed:

Entrance to Milford Haven.—A can buoy, coloured *red and white striped*, will cover the two fathoms patches on the west side of the eastern channel into Milford Haven.

Channels inside the Scarweather Sand.—In consequence of changes in the Hugo channel, the Shord and Kenfig channels will be buoyed as follows, viz.:—

A *black* can buoy will be placed on the north side of the Scarweather Middle, and a *chequered black and white* can buoy will be placed on the south edge of the Hugo bank.

A conical *black* buoy will be placed on the shoal N.E. of the Hugo bank.

The present Hugo bank buoy will be discontinued.

The Nash Sand.—The Nash swatchway buoy will be removed one mile to the westward, and will be a can buoy coloured *red and white in vertical stripes.*

A new can buoy will be placed to the southward of the Nash middle, and will be *chequered red and white.*

King Road.—A can buoy, *red and white in vertical stripes*, will be placed on the west end of the Newcome shoal.

A *red* conical buoy to the northward of the Firefly rock.

A *red* can buoy to the north of the Flatness rocks.

The Cockburn buoy will be painted *red and white, chequered.*

A strip (or streak) of *green* light will be shown from the Avon light-house from between the bearings E.S.E. and E. by S. to facilitate the navigation of the river by night.

All Bearings are Magnetic. Variation 22° *Westerly in* 1868.

No. 24.—INDIA—WEST COAST.—*Fixed light at Cochin.*—From the 15th day of January, 1868, a light will be exhibited from a lighthouse recently erected at Cochin, Malabar coast.

The tower stands in lat. 9° 57·8′ N., long. 76° 14·7′ East.

This light is substituted for the one formerly shown from the flagstaff.

Anchorage.—The best anchorage in Cochin roads is with the following bearings, viz. :—Lighthouse from E. ¾ N. to E. by S., 2 to 2½ miles off shore, in from 5½ to 6½ fathoms, soft ground.

All Bearings are Magnetic. Variation 0_0 *in* 1868.

No. 25.—WEST INDIES.—BRITISH GUIANA.—*Alteration in position of light vessel off Berbice river.*—The position of the light vessel off the entrance of Berbice river has been changed. She now bears N.E. by N. (N. 31° E.), 9 miles from St. Andrew point, and is in lat. 6° 29·2′ N., long. 57° 23·7′ West.

All Bearings are Magnetic. Variation 2° *Easterly in* 1868.

SOUTH PACIFIC OCEAN.—*Fiji Islands.*—Dangers in the neighbourhood of the Fiji islands, reported by Captain Charles W. Hope, R.N., H.M.S. *Brisk*, November, 1867.

All Bearings are Magnetic. Variation 10° 20′ *Easterly in* 1868.

Frost Reef.—This reef from various observations is 4½ miles to the W.S.W. of the approximate position given in the Charts; it is in lat. 17° 24½′ S., long. 179° 21′ west, and bears W. by N. ½ N., nearly seven miles from the west extreme of Mango island.

Morse Reef.—Supposed to be not correctly placed on the Chart, and to the eastward of the position assigned to it.

Coral Patch westward of Ovalau.—There is a coral patch off the rivulet Mbu-re-ta, W. by S. ¾ S., distant two-thirds of a mile from its entrance or E. by N. rather more than a mile from the north point of Moturiki.

Coral Patches off Leleuvia Island.—Two sunken patches were distinctly seen from H.M.S. *Brisk*, N. by W. to N.N.W., half a mile from Leleuvia island; be careful when passing through the Moturiki channel.

Currents.—A current setting westward, of two or three knots an hour, is said to be generally found by the local traders about Vatoa (Turtle island). The *Brisk* throughout the Fiji group found only a set to the north-westward of about half a knot, that may be attributed to the surface drift caused by the S.E. trade winds.

Sunken Rocks have been reported, on authority at present unknown, in the following positions :—

Lat. 17° 49½′ 18° 24′ S., 179° 2½′ West, 179° 34′ East, with two fathoms and breakers in 16° 7½′ 179° 43½′ West.

Technical Instruction.

The Lords of the Committee of Council on Education have approved of the publication of the following Explanatory Memorandum to accompany their Minute of 21st December, 1867.

This Memorandum shews fully the aid which the State affords in promotion of Technical Instruction at the present time.

1. It will be seen that this Minute creates three descriptions of scholarships or exhibitions for the encouragement of Science Instruction, and for the support of students of the industrial classes while continuing their education. These are intended to supplement and enlarge existing action on the part of the Science and Art Department, and to promote secondary instruction in elementary schools, thus forming a connecting link between them and the Science and Art schools and classes.

Action of the Science and Art Department.

2. The existing action through the Science and Art Department is to aid instruction in *Science* in the following subjects:—1, practical plane and solid geometry; 2, machine construction and drawing; 3, building construction *or* naval architecture and drawing; 4, elementary mathematics; 5, higher mathematics; 6, theoretical mechanics; 7, applied mechanics; 8, acoustics, light, and heat; 9, magnetism and electricity; 10, inorganic chemistry; 11, organic chemistry; 12, geology; 13, mineralogy; 14, animal physiology; 15, zoology; 16, vegetable physiology and economic botany; 17, systematic botany; 18, mining; 19, metallurgy; 20, navigation; 21, nautical astronomy; 22, steam; 23, physical geography. And in *Art* in Elementary Drawing as an education of the power of observation and in drawing, painting, modelling, and designing for manufacture and decoration.

3. In order to place a school or class in connection with the Science and Art Department, it is necessary that a committee, consisting of at least five persons should be formed, who will undertake certain duties of superintendence in connection with it.

Aid to Instruction in Science.

4. *As respects Science*, the aid consists of—(1) payments to the teachers on the results of instruction as tested by examination, (2) medals and prizes to the successful students, (3) grants to the school in aid of the purchase of apparatus to the extent of fifty per cent. of the cost, and (4) Royal Exhibitions and free admissions to the Royal School of Mines in London and the Royal College of Science in Dublin.

Payments to Teachers.

5. The payments to the teachers vary from £1 to £5 according to the class in which the student is placed. There are five classes, the fifth being the lowest. The payments are only made for the instruction of students of the artizan or weekly wages class, and those whose

incomes are less than £100 per annum. The teacher to be qualified to earn payments on results must have taken a first or second class, unless he has obtained some University degree.

Examinations.

6. The examinations are held in May. The examination in each subject is held over the whole kingdom on the same night. It is not necessary to enable a class to be examined and obtain prizes, etc., that the teacher should be certificated. If a satisfactory committee be formed, any class or single student can be examined, however taught.

Prizes.

7. Prizes, which, with some few restrictions, are open to all students, are given to those who obtain a first, second, or third class. To the best in each subject are given a gold, a silver, and two bronze medals.

8. Six Royal Exhibitions of the value of £50 per annum, tenable for three years, are given in competition at the May examinations. Three of these are to the Royal School of Mines in London, and three to the Royal College of Science in Dublin. Free admissions are given to the courses at these institutions to all who take gold medals.

9. The detailed rules will be found in the Science Directory, published by the Department, price sixpence, which will be furnished on application to the Secretary, Science and Art Department.

Aid to Instruction in Art.

10. *As respects Art.—Firstly.*—Towards the teaching of elementary drawing in schools for the poor. This aid consists of payments to the managers of 1s., 2s., or 3s., on account of children satisfactorily taught drawing, and who pass a very elementary examination of the first grade; and of payments of 5s. or 10s. on children or pupil-teachers who pass the more advanced or second grade examination, and of prizes to successful children and pupil-teachers.

The first grade consists of drawing in outline from flat examples, drawing from regular solids or objects of simple form, and of easy problems in practical geometry.

The second grade is an examination of a higher standard than that of the first grade, but in the same subjects, with the addition of perspective and mechanical drawing. Examinations are held in May in any elementary school taught by a master holding a certificate for drawing, or who has passed a second grade examination in any of the above three subjects of drawing taught in elementary schools.

Night Classes.

11. *Secondly.*—Towards art instruction in night classes for artizans held in elementary schools, in literary, mechanics', or similar institutions. This aid consists of payments of 10s. or 15s. on account of artizans or their children above twelve years of age satisfactorily taught drawing of the second or third grades; of prizes to successful students; and of payments towards the local expenses of examination.

The third grade is represented by works embracing the whole course of instruction in night classes or schools of art, such as drawing from examples, from casts or models, from nature, the antique, or the life;

painting, flowers, landscape, or from life; designing or drawing for decorative purposes.

Schools of Art.

12. *Thirdly.*—To schools of art held in rooms entirely devoted to art instruction. This aid consists of similar payments to those awarded to night classes, and of the following additional payments:—

20s. on account of every artizan satisfactorily instructed in art.

£15 or £30 on account of art pupil-teachers.

£5 or £10 on account of students trained for art teachers or national scholars.

£3 on account of free studentships to artizans submitting advanced works.

£10 on account of expenses of annual report and examination.

13. Prizes are given to successful students, and the advanced studies of the schools of Art are brought together in a National competition, when gold, silver, and bronze medals, and other prizes are awarded. All payments are contingent on the employment of certificated teachers.

14. Elementary schools, night classes, and schools of Art are aided to the extent of 75 per cent. in the purchase of examples.

National Art Training School.

15. *Fourthly.*—By the maintenance of the National Art Training School at South Kensington, in which highly qualified students from local schools of Art are admitted and trained as masters for schools of Art, or as designers, or art-workmen. Such students receive allowances for their support of from 15s. to 40s. weekly.

Art Museum and Library.

16. *Fifthly.*—Through the National Museum of Decorative Art and the National Art Library, which are made as far as possible circulating collections for the benefit of local schools of Art.

17. The detailed regulations for the administration of Art Instruction are given in the Art Directory.

Secondary Instruction in Elementary Schools.

18. *As respects Elementary Schools.*—By the Minute of the 20th February, 1867, additional grants are made by the Education Establishment at Whitehall to elementary schools under inspection for instruction in subjects of secular instruction beyond reading, writing, and arithmetic. The regulations under which such grants are made are issued by the Education Establishment, Whitehall.

Science Classes in Elementary Schools.

19. The managers of an elementary school under inspection can permit their premises to be used for science teaching provided that there be no interference with the primary purpose of the elementary school or its three attendances. A science class may thus be formed in connection with and receiving payments from the Science and Art Department. But no payments are made to teachers on account of Science teaching in respect of any instruction in Science that may be given during the three attendances of an elementary school receiving aid from the Education Establishment, Whitehall.

20. In an elementary school not under the inspection of the Education Establishment, and, therefore, not receiving State aid to elementary instruction, science classes may be formed in connection with the Science and Art Department without any restriction as to the time or manner in which the instruction in science may be given.

Elementary Schools' Scholarships.

21. From this brief explanation it will be understood how the Minute of the 21st December will affect existing institutions. This Minute provides for two forms of scholarship in connection with elementary schools whether receiving state aid as such or not. The first of these is the elementary school scholarship. £5 are granted to the managers of any elementary school for the support of a deserving pupil if they undertake to support him for a year and subscribe £5 for that purpose. One such scholarship is allowed per 100 students in the school. The selection of the student for the scholarship is to be by competition; the details of this, however, the managers of the school may arrange as they please, subject to the approval of the Science and Art Department. The payment of £5 by the Science and Art Department is made conditional on the student passing in a branch of science at the May examination.

Science and Art Scholarships.

22. The second, a more advanced scholarship, is "the Science and Art Scholarship," of which, again, there may be one per 100 students. This is granted without any corresponding contribution on the part of the locality. The Science and Art Department makes a grant of £10 towards the maintenance, for one year, of the most deserving student or students in an elementary school who have taken a first grade in Elementary Geometry and Freehand or Model Drawing,* and passed in some branch of science, on condition that, at the end of the year, the student obtains at least a third class in the subject of science in which he originally passed or passes in some other subject. In both these cases the student must be from 12 to 16 years of age.

Science College Scholarships.

23. Lastly, for advanced scientific instruction, the Minute offers local exhibitions to enable students to complete their education at some college or school where scientific instruction of an advanced character may be obtained. The Science and Art Department will make a grant of £25 per annum, for one, two, or three years for this purpose when the locality raises a like sum by voluntary subscriptions. And if the student attend a State school, such as the Royal School of Mines in London, the Royal College of Chemistry in London, or Royal College of Science in Ireland, the fees are remitted. It is a condition that the exhibition is awarded in competition, the branch or branches of science for which may be fixed by the locality, and that the student pursues his studies satisfactorily.

* The examination in drawing can, where there is no Art Certificated Teacher, be held by the Science Class Committee, to whom the necessary papers will be sent.

Notes on Novelties.

On the 14th March, the new docks at Millwall were formally opened with much ceremony. These docks will prove of great benefit to the river, as they form an important addition to its private dock accommodation. The docks and warehouses occupy about two hundred and four acres, and of this extensive area there are thirty-five acres of water for dock accommodation. When the scheme is entirely completed, there will be upwards of fifty-two acres, leaving one hundred and fifty-two acres available for wharves and warehouses. The floating dock is three hundred and fifty feet in width; it has two entrance locks, one, the first, of two hundred and fifty feet long, and the second two hundred feet, and both with a width of eighty feet, and a depth at the sill of the lock of twenty-eight feet below Trinity high water mark. This allows for the admission of vessels of greater length and breadth than any at present built, the *Great Eastern* alone excepted. Near the floating dock is a graving dock for the repairs of vessels. Its length inside the sill is four hundred and fifteen feet, and its width sixty-five feet, with a depth of water of twenty-five feet below Trinity datum. All the locks are provided with hydraulic power for working the gates, the bridge, and sluices, and one three-ton and one five-ton capstan. Hydraulic power is also applied to the drawbridge between the inner and outer dock, and to some of the cranes in connection with the warehouses. Nine warehouses have already been constructed, two of which are three hundred feet long; four, two hundred feet long; and three, one hundred feet long. They are fitted with twelve thirty-five cwt. cranes, one five ton crane, one of fifteen tons, and a sheerlegs, equal to a weight of eighty tons, is in course of erection. The works have been constructed well and cheaply, the land not having been costly to acquire. The docks offer unusual facilities to vessels entering or leaving the river; there is ample railway communication close at hand, and, if a short canal of about two hundred feet long were cut, it would give access to the West India, and through them to the East India Docks, thus opening up one of the finest series of docks in the kingdom.—*Mechanics' Magazine.*

The following return of the receipts of the Atlantic Telegraph Cable shows in a remarkable manner the importance of this communication between the Old and the New World to the interests of the mercantile community of England and America. Receipts each day from midnight to midnight compared with those at the corresponding period of last year:—

1868.		1867.	
Feb. 16, Sunday ..	£764	Feb. 16, Saturday ..	£1,181
„ 17, Monday ..	1,497*	„ 17, Sunday ..	436
„ 18, Tuesday, ..	1,599	„ 18, Monday ..	668
„ 19, Wednesday	1,620	„ 19, Tuesday ..	1,026
„ 20, Thursday ..	1,929	„ 20, Wednesday..	1,031

* On this day the land lines of telegraph in Ireland were broken by a gale of wind.

PAPER BOATS.—A boat maker of Troy, New York, has lately constructed a paper boat thirty feet long, which weighs but forty pounds, and is in every respect superior to boats made of wood. It is thin, lighter than a wooden boat, is rendered impervious to water by a coating of oil and other compounds, and is claimed to be more durable, and that it will stand shocks that would destroy a wooden shell. Such a boat cannot be split or broken, but if a hole be made in it by accident, the perforation will be no larger than the size of the object piercing it, and could be easily mended; it will not swell nor crack, requires no caulking or pitching, and, above all, the cost is much less than a wooden boat.

THE VALUE OF A WHALE.—It is somewhat remarkable that whalemen seldom go to law about whales, although disputes frequently arise among them while on the cruising grounds respecting the rights of each, where two or more vessels are engaged in the pursuit or capture of one whale. They have their code among themselves, and to their honour be it said, seldom fail to settle all disputes without resort to courts. A case occurred in the Ochotsk last summer, in which two claimants for a whale appeared, and being unable to settle it, it was brought into our admiralty court. This is the first suit of the kind that has ever been tried here, though in the courts of Massachusetts several decisions have been given, regarding the ownership and value of whales. Judge Robertson's decision is a very important one, and will be read with interest by whalemen especially. From it we learn that a medium sized whale, in a legal point of view, is set down as yielding one hundred and fifty barrels of oil and two thousand pounds of bone. Oil is worth now in New Bedford over one dollar a gallon, and bone over one dollar and a half per pound, making the value of a medium sized whale about seven thousand five hundred dollars! In the suit referred to the whale was killed or captured jointly by the crews of the *Oregon* and *Richmond*, and the court awarded one-half of the oil and bone, seventy-five barrels of oil and one thousand pounds of bone, to each ship.

MR. EDITOR:—As all the brethren say, you like to get a few lines from every one, telling when and where they see and catch whales, so here's my report: We left Honolulu April 24th, sighted Shamangin Island May 10th, and saw nothing till we reached Queen Charlotte's Island, where we saw a few whales and struck only two, one of which we saved. Left the Kodiack July 6th, for Bristol Bay, passing through the Ounimac passage. After cruising there some time, with good weather but no whales, went to St. Paul's Island, where we took our first whale August 17th, and the last on the 27th, making seven in all about the Island. The third one we took was a stunner, and deserves special mention. It was the biggest whale, by at least one quarter, that I ever saw alongside a ship. My third mate kept a tally of what turned out at the cooler, and it yielded *three hundred and ten barrels and nineteen gallons*. It was not so fat as some we caught. I have

taken whales that have made two hundred and fifty barrels of oil, but never saw one that would compare in size with this. I think it must have been one of the original whales that Noah had charge of, which has been growing ever since.

During August and September, we had fine weather mostly. Early in October, had a gale. Put away for the Islands on the 7th, arriving here on the 26th October, with one thousand barrels of oil and nine thousand pounds of bone. Yours, respectfully,

J. B. WINSLOW,
Master Bark Tamerlane.

From the foregoing, which we find in the *Commercial Advertiser* of the Sandwich Islands, it would appear that the whaling voyage of the *Tamerlane* would have produced between three and four thousand pounds sterling.

THE SUEZ CANAL.—The last number of the *Isthme de Suez* journal gives details of the works, which are being prosecuted with such vigour that the directors persist in affirming that the canal will be finished in 1869. The transit is becoming more and more developed, and from January 4th to February 7th, one hundred and thirty-seven barges of merchandise passed from one sea to the other. On February 6th, there were at Port Said four three-masters and three brigs occupied in landing large cargoes of coal. The receipts in 1867 amounted to 1,292,822 francs. The first quarter gave 255,000 francs; and the fourth 474,000 francs. The transit continued to be active in January, 1868. The expedition to Abyssinia was producing a considerable movement, as men and war material arrive at their destination most rapidly by way of Suez. In consequence, business was active at Port Said, while at Cairo and Alexandria commerce was in a state of complete stagnation.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, *in March*, 1868.—*Sold by J. D. Potter*, 31, *Poultry, and* 11, *King Street, Tower Hill, London.*

502. $\frac{DE}{2}$m = 10·0 West Indies, Carlisle Bay, Barbados Island, Commander Venox, R.N. 1865. 1s.

1901. DEm = various. British Columbia, Anchorages between Cape Caution, and Port Simpson, D. Pender, Navigating Lieutenant, R.N. 1867. 2s. 6d.

1223. DEm = 6·0 Africa, S.E., Kowie river or Port Alfred, Staff-Commander Stanton, R.N. 1867. 1s. 6d.

752. $\frac{DE}{2}$m = 0·4 Australia, South Australia, Victoria Port, Commander Hutchinson, R.N. 1867. 1s. 6d.

29. $\frac{DE}{2}$m = 10·0 South Pacific Ocean. Opare Harbour and View, Messrs. Quale and Lusher. 1867. 1s.

EDWARD DUNSTERVILLE, *Commander, R.N.*

***Hydrographic Office, Admiralty, 20th March,* 1868.**

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

MAY, 1868.

Arctic Discoveries from Behring Strait.*

It is not improbable that all the enterprise of our navy, after the extended discoveries made by its voyages in the Arctic regions, is gone to rest, notwithstanding the recent little agitation of the question in the hope of its resuscitation. The old question which disposed of it in its last days has remained on it as a kind of incubus—the *cui bono?*—seems to have been the *quietus* which has exerted its weird influence, and still holds the whole subject in abeyance as far as British enterprise is concerned in the Arctic Seas. Something has been recently said of French navigators looking towards exploration in the Arctic regions, and we have even heard of Prussian nautical enterprise as being likely, now that Germany is a veritable maritime power, and has a slice of the coast of our northern seas (having of late obtained a grand maritime station with an arsenal from which to send her fleets), we have heard something said of a Prussian Arctic Expedition. But although our Mercantile Navy is most considerately making sailors † for our Prussian neighbours, we confess to more confidence in our American cousins. We know they have already done more in that way than Prussian ships (unknown as yet to the icy sea of the north), and we shall by no means be surprised to find some Yankee whaler, from her whaling ground in the Pacific, stealing a march into the "Arctic" as they call it, that portion of the sea where they are well known, and instead of laying her head for Behring Strait, as hitherto, boldly standing north, and squeezing her way through and passing the Pole, finding her way by Spitzbergen into the Atlantic on her return

* Our February Number, page 94, contains more on this subject.

† Of course all foreign sailors (or landsmen, who do as well!) are here included, in pursuance (perhaps for cheap sailing) of that suicidal law of sailing British Merchant Ships with crews *two-thirds* of whom may be *foreigners!*

to New York, notwithstanding the doubts we have heard from Parry himself on that subject.

This may appear as a kind of Arctic dream. But it is one, which although unlikely, that may yet be realized, and once accomplished, it would be a feat of which we might have a repetition: and thus after all our exertions, all our desire to turn to some account, that Arctic Sea which has baffled all our navigators, the voyage *from* the N.W. instead of *to* the N.W. may yet become a common highway, opened for use by Yankee enterprise! These speculations have been produced by the perusal of the annexed letter of Captain Long, which has appeared in a Sandwich Island paper. We certainly concur in his view of the subject, and have added an occasional remark to the very interesting particulars which he has stated. It is reasonable to conclude that the surplus waters of the Arctic Sea, derived from the numerous rivers of the continent of Asia, would find their way to the Atlantic Ocean by the drift between Spitzbergen and the Norwegian Coast, as assuredly those do from the American continent by Davis Strait. That sea is always receiving the tributes of those rivers, sending little or nothing from them through Behring Strait, and notwithstanding their condensation by cold, must dispose of it as it does by the Atlantic.

However, without further remark, for many of our readers can anticipate all we might say, we shall transfer the whole account as we find it to our own pages, assuring our American friends that should their enterprise be crowned with success, in making the voyage across that Polar Sea, which has always frustrated the exertions of our navigators, we shall hail their success in having unlocked the portals of the North as Columbus did those of the West.

The *Commercial Advertiser* says:—

In our issue of November 9th, we inserted a very interesting letter from Capt. Thos. Long, giving an account of the discovery of land in the Arctic Ocean. That article was copied in full in some of the California papers, and telegraphed to the New York *Herald* and published there on the 8th of December, as one of the most interesting discoveries made during the year.

At our request, Capt. Long has prepared a statement of his observations, regarding the best route for reaching the open Polar Sea, and his reasons why it can only be accomplished from the Pacific Ocean. We do not hesitate to say that it will prove to be one of the most forcible arguments yet given to the world, why the Polar Sea cannot be reached from the Atlantic, and why future expeditions should only be sent from this ocean via Behring Straits.

Many facts stated by Captain Long will be new to our readers, and valuable to those who may engage in those expeditions, for we firmly believe that the open Polar Sea exists and that it will yet be reached, navigated, and explored in some kind of a craft which Yankee ingenuity may invent. Both Kane and Hayes reached what they supposed to be the shore of the Polar Sea, but without wishing to detract from the honour due to them, it must be said further

evidence as to its existence and extent is eagerly sought for by the scientific world.

The following is Captain Long's letter:

MR. EDITOR:—At your request, I venture a few remarks upon the Northern Polar Ocean, and my own impressions in regard to the best method of making a passage from the Pacific to the Atlantic Ocean by a northern route, or a communication by water north of America or Asia between these two oceans. Before giving my own views on this subject, I think it right and proper to take a partial retrospect of the causes which first led to these northern explorations, and of a few of the efforts made to accomplish this object.

Soon after the discovery of the Pacific Ocean by Balboa in 1513, and the passage of Magellan through the Strait which bears his name, and across the Pacific Ocean in 1521, the enterprise of the governments and people of Northern Europe, and especially of England, was stimulated to find a more direct route north of America by which to reach this ocean. Frobisher's expedition in 1557 (which entered Hudson's Bay), was probably the first systematic endeavour made for this purpose.* Since then an almost innumerable amount of expeditions have been fitted out for this object, and an enormous amount of life and treasure has been expended in these efforts. The English Government has been very liberal, not only in offering rewards (some of them as large as £20,000 sterling) to stimulate individual enterprise, but also in sending numerous expeditions at the expense of the Government for this purpose. Not only did the Government offer this large reward for making the North-west Passage, but they offered large rewards to any one who should reach certain indicated points in the Polar Sea. Parry, in 1820, was the first and, I believe, the only one who reached any of these points.

It would require too much time and space to enumerate all the expeditions fitted out for this purpose. I shall therefore notice a few only, which have a direct bearing upon the ideas which I propose to advance.

During these earlier northern voyages, there were two theories in regard to the character of the Polar Ocean, each of which had, and, I believe, still has numerous advocates. One was that the Polar Ocean was of unfathomable depth, and was proved by soundings taken north of Spitzbergen, and the diameter of the sea being nearly 2,000 miles, there must be a sufficient agitation of its waters to prevent any great accumulation of ice upon its surface. This, together with the idea of a system of revolving currents for the Arctic Ocean, constituted the theory of the Polists, of which Barrington and Barrow were the earliest advocates.

On the other side, the anti-Polists, of whom Professor Leslie was the head, contended that the temperature decreased regularly as you proceeded towards the north, and that therefore the Polar Sea must

* We consider Baffin's, with whom was Davis, as far more important than Frobisher's.

be so much encumbered with ice, as to make it impossible to penetrate it.

All speculative theories must yield to the testimony of direct observations. I will therefore offer a few of these evidences of direct observation, that we may see which theory has the best foundation.

Wrangell, in the month of March, 1823, in lat. 70° 50′ N. and long. 175° 30′ E., saw an open sea violently agitated by the winds and large masses of ice thrown with great violence against the main body of the shore ice. He says:

"We climbed one of the loftiest ice-hills, affording an extensive view towards the north, and from thence we beheld the wide, immeasurable ocean spread out before our gaze. It was a fearful and magnificent spectacle, though to us a melancholy one.

"Fragments of ice of enormous size were floating on the surface of the agitated ocean, and were dashed by the waves with awful violence against the edge of the field on the farther side of the channel before us. These collisions were so tremendous that large masses were every instant broken away, and it was evident that the portion of ice which still divided the channel from the open sea would soon be completely destroyed."

Upon finding he could proceed no farther, he adds:

"With a painful feeling of the impossibility of overcoming the obstacles which nature opposed to us, our last hope now vanished of discovering the land which we still believed to exist: and we saw ourselves compelled to renounce the object for which we had striven through three years of toil and danger.

"We had done, however, all that duty and honour demanded, and any further attempts being totally hopeless, I determined to return."

Such was the condition of the Polar Ocean at this point on the 23rd of March, 1823. On his return towards the shore he encountered innumerable difficulties from the breaking up of the ice. One scene I will give in his own words, which occurred on the fourth day of their return journey, the 27th:

"We had hardly proceeded one verst, however, when we found ourselves in a fresh labyrinth of lanes of water hemming us in on every side. As none of the pieces floating around us were as large as the one on which we stood, which was 75 fathoms across, and there were certain indications of an approaching storm, I thought it best to remain where we were, and thus awaited quietly whatever Providence should decree. Dark clouds now rose from the west, and the whole atmosphere became filled with a dense vapour, while a strong breeze suddenly springing up from the same quarter, increased in less than half an hour to a gale. Every moment huge masses of ice floating around us were dashed against each other, and broken into a thousand fragments.

"Meanwhile we were tossed to and fro by the waves, and gazed in helpless inactivity on the wild conflict of the elements, expecting every moment to be swallowed up. We had been three long hours in this painful position, and still our island held together, when suddenly

it was caught by the storm and hurled against a large field of ice. The crash was terrific, and we felt the mass beneath us giving way and separating in every direction. At this dreadful moment, when destruction seemed inevitable, the impulse of self-preservation implanted in every living being, saved us. Instinctively, and with the quickness of thought, we sprang on the sledges and urged the dogs to their utmost speed; they flew across the yielding fragments to the field against which we had been stranded, and safely reached a part of it of a firmer character, on which were several hummocks, and here the dogs immediately ceased running, apparently conscious that the danger was passed. We were saved, and joyfully embracing each other, we united in thanks to God for our preservation."

Such was Wrangell's description of the Polar Ocean in March, 1823. The evidence also of Headenstrom, Tartarinow, Anjou, and Matiuschkin, who were interrupted by this open sea at every point where they endeavoured to penetrate towards the north, proves that this sea is open in March and April from lat. 76° 50′ N. and long 138° E., to lat. 70° 50′ N. and long. 175° 30′ E., a distance of more than seven hundred geographical miles.

Morton, who accompanied Dr. Kane in his expedition in the *Advance* up Smith's Sound, saw from the north coast of Greenland, in lat. 81° 15′ N., an open sea entirely free from ice, nearly on the opposite side of the Polar Ocean from whence it was seen by Wrangell and Anjou. Observation has also proved that the temperature rises as you recede from the land towards the north. Parry, who wintered both at Melville Island and Igloolik Island, in Hudson's Bay, found the season more advanced in May at the former than at the latter place, although Melville Island is nearly six degrees farther north than Igloolik. Franklin, also, who wintered at Great Bear lake, found the temperature during the winter nearly as low as Parry found it nine degrees farther north. In Spitzbergen, which is of small extent and separated from any large body of land by a distance of more than three hundred miles, deer propagate in 80° of latitude. Rain also has been known to fall in the latter part of December at Cherrie Island, in lat. 75°. The fact also that icebergs, which require land for their formation, are only found near the coast of Greenland, is evidence that no great body of land exists in this Polar Ocean to decrease its temperature and interrupt its navigation.

Assuming then the existence of this open Polar Ocean (though possibly not entirely unencumbered by the ice), I venture to give my own opinion of the best route by which a passage from one ocean to the other can be accomplished, and a near vicinity to the North Pole reached at the same time. Nearly all the attempts which have heretofore been made to reach the North Pole and communicated by vessels by a northern route between the Atlantic and Pacific Oceans, have been prosecuted through Baffin's Bay and the Greenland Sea, *where they have uniformly encountered an adverse current, which together with the large masses of ice which were drifted south by this current, have always baffled their attempts.*

Parry in 1827 undertook to reach the North Pole by means of boats drawn upon sledges The highest point which he attained was lat. 82° 45′, and in reaching this point he travelled north two hundred and ninety-two miles, and found himself but one hundred and seventy-two miles from the place of his departure thirty-five days before, showing a current setting south at the rate of three and a half miles per day. At this, the highest point which he reached, he also found the ice broken in small pieces and not so thick as that farther south, *showing there must have been much open water to the north to cause sufficient swell to break up the ice in this manner.* In his description of the ice at this point he says: "So small was the ice now around us that we were obliged to halt for the night upon the only piece of ice in any direction on which we could venture to trust our boats while we rested." Such was the ice in lat. 82° 45′.

The *Advance* and *Rescue*, under the command of De Haven, were frozen up in Wellington Channel, and from the 2nd of October, 1850, until the 8th of June, 1851, a period of two hundred and forty-nine days, drifted through Barrow Strait, Lancaster Sound, and Baffin Bay, a distance of nearly one thousand miles,—about the same rate of drift which Parry found north of Spitzbergen in the summer season.

One of Sir Edward Belcher's ships, the *Resolute*, abandoned by him near Melville Island, drifted through the same channels, and was found by an American whaler in Davis Strait, about one thousand miles from where she was abandoned.

The great quantities of drift-wood and the character of the wood (found only in high northern latitudes) which is found upon Spitzbergen, Iceland, and Greenland, is another evidence of the existence of this continuous current from the north towards the south, and which must have carried this wood across the Polar Sea from the shores of Asia and America, as it could not have reached there from any other quarter. Having thus shown from well authenticated evidence the existence of this current, the question naturally occurs,—*what is its cause?*

When we take into consideration the fact that in the whole of Northern Asia, East of the Ural mountains, to Behring Sea, and as far south as latitude 50° N., and in some instances as far as 45° N., *the rivers flow into the Arctic Ocean*, two of them, the Yenisei and Lena, being navigable for boats *a distance of two hundred miles each*, together with the rivers on the North American Continent from 60° N., comprising an area of nearly five million square miles, it is evident there must be some outlet for this great volume of water. That any great portion of this water finds its way south through Behring Strait, is disproved by the observations of whalers, who have cruised in this region since 1847. The currents here have been found variable. In the spring and summer the current is always found setting *towards the north*, which is probably owing to the large river Anadyr on the Asiatic, and the rivers which empty into Behring Sea at Port Clarence and Norton Sound on the American side, whose waters are much increased by the melting of the snow during the spring and early summer months.

In the autumn and winter months, from information derived from the natives of the coast and whalers that have wintered in Plover and St. Lawrence Bays, the current is found setting towards the south. The force and direction of these currents are also proved by the drifting of vessels which have been wrecked north of Behring Strait. The bark *Gratitude*, of New Bedford, was wrecked near lat. 82½° and long. 168°, about forty miles from Cape Lisbourne, in the early part of July, 1865, and in the month of August was seen near Herald Island, one hundred and seventy miles in N.N.W. direction from where she was wrecked. The *Ontario*, of New Bedford, was wrecked in September, 1866, in lat. 70° 25′, and during the following winter was seen by the natives drifting through Behring Strait towards the south, and it is reported that some of them visited her. She was afterwards seen on shore in about lat. 64° 50′.

It appears evident, therefore, that these winter and summer currents nearly equalize or compensate each other, and that Behring Strait affords an insufficient outlet for the great body of water which flows into the Polar Sea from the northern slopes of Asia and America.

As the evaporation in this region is nearly if not quite compensated by condensation and precipitation, we must conclude that the avenues for the discharge of this great body of water are the passages between Nova Zembla, Spitzbergen, Greenland, and Davis Strait, where this continuous current has been found setting towards the south.

Let any person look at a chart of the Northern Hemisphere, and they will see that the form of the Polar Ocean is nearly circular, its circumference being five or six thousand miles. In two-thirds of this circumference, large rivers are flowing into the sea at regular intervals, while in the other third there are openings for the escape of this water; and unless this water is absorbed by the atmosphere and carried south by the wind (which theory I think is incorrect), it must find its way south by some of these channels.

Instead then, like Sisyphus, of ceaselessly contending against insurmountable obstacles and these continuous adverse currents, which have been found to exist, and the causes of which I have endeavoured to explain, I would wish to profit by the experience and observations of former navigators, and avoiding the difficulties which they encountered and endeavoured to overcome, I would avail myself of the assistance of this current for the purpose of crossing this Polar Ocean. In earlier times there were great difficulties in the way of sending expeditions from the Pacific for this purpose, but since the opening of the gold fields of California these difficulties have in a great measure disappeared, and the facilities at the present time for fitting out Polar expeditions from the Pacific are nearly equal to those of the Atlantic side. With the exception of the vessels, the other appliances for a voyage of this kind are easily obtainable, and at very reasonable rates. I believe, therefore, that a vessel fitted out from this port for this object would have a greater prospect of success than any which has heretofore attempted it.

Besides the ordinary articles which are necessary for a voyage of

this kind, easily obtained here, there is one which is an infallible antidote against scurvy, the terror of these long Arctic voyages. This is the *kalo* (or the food of the native Sandwich Islanders) prepared in the form of *pai-ai* and packed in casks. It is highly nutritious, and although it undergoes a slight fermentation before reaching a high latitude, I think this improves rather than diminishes its antiscorbutic properties. I have myself used it twelve years in whaling voyages to the northern sea, and whenever there has been a sufficient supply on board *there have been no symptoms of scurvy.* Unlike the potato, it is not injured by frost, but can be kept in the lowest temperature without changing its qualities. Not only is it invaluable as an article of diet in preserving the health of the crew, but properly prepared by the addition of a little carbonate of soda or potassa to neutralize its accidity, and made into cakes, it is, in the absence of fresh vegetables, a positive luxury, to which any foreigner will soon become accustomed and enjoy. With a supply of this article on board sufficient to give each person one pound per day, and with proper regulations with regard to clothing and exercise, the scurvy would never make its appearance.

Another article of prime necessity for these voyages is *reindeer skin clothing*, which can easily be procured along the shores of Behring Sea and the Arctic Ocean, as far as Cape North. During the summer months the people called Tschucktschi visit the coast with their herds of reindeer, from whom, with a few articles, such as large sheath knives, hatchets, kettles, tobacco, etc., an abundant supply can be obtained at a trifling cost. The reindeer themselves can also be procured in great numbers and their flesh preserved fresh for a long time in those high latitudes. Walrus are abundant from Cape Serdze to Cape North; and their flesh, though not so valuable as fresh beef or mutton, is preferable to salted meat.

The vessel for this voyage should be from two to three hundred tons, and of light draught of water. She should be strongly fortified against pressure or concussion from ice. The assistance of steam would also be of great importance, although the occasions would be rare in which it would be required. In my own experience I have seen occasions where by the aid of steam for a few hours a detention of weeks would have been avoided. The steam power should be so attached to the vessel as to be removed and replaced at pleasure, to prevent injury from the ice.

The *route* I would recommend as the best would be to follow the Asiatic shore from Behring Strait as far as Cape Kekurnai or Cape Schelagskoi. The ice, which melts earliest near the shore, and the melting of the snow upon the land forming innumerable streams of water, impels the ice from the shore, leaving an open lane of water near the shore, through which a ship can pass without difficulty, especially when assisted by steam in calms and adverse winds. After passing Cape Jakan, there being no land to the north, the ice is driven from the shore by these streams and scattered in the open sea seen by Wrangell, with sufficient openings for the safe navigation of a ship.

In the month of August last, the bark *Nile* passed over a position within ten miles of the point where Wrangell saw the open sea in March. From some point between Cape Kekurnai and Cape Schelagskoi the course would be from north to north-west, as the ice would permit, until north of the Läächow Islands, when the effects of the current from the rivers of Northern Asia would be sensibly felt. From thence a course directly towards the North Pole or Spitzbergen, as would appear most feasable, should be pursued.

After getting to the north of the Läächow Islands, should a vessel be obstructed by ice, the current, though not as strong as that found north of Spitzbergen and in Baffin Bay, *would eventually carry the vessel through one of these channels into the Atlantic.* In the event of any disaster to the vessel, the chances for the preservation of the lives of those on board are much greater than by the route east from Behring Strait, as from the river Kolyma to the westward, Russian settlements are found near the mouths of all the rivers, where assistance can be procured.

Another route by which this voyage can be accomplished is to follow the shore from Behring Strait to the mouth of the river Lena, and from thence directly north beyond Cape Seivero Vostoschni; from thence to the westward towards Spitzbergen. After passing the mouth of the Lena, a vessel would receive assistance from the current of this river and the other rivers between the 105th and 140th meridians.

The effect of those large rivers in impelling the ice from the land was seen by Franklin, in his expedition from Great Bear Lake in 1826 down the Mackenzie River, and along the shore to Point Barrow. In this expedition, he reached the longitude of 140° W. with but little impediment from ice on the 15th of August. At this point he determined to return. His associate, Dr. Richardson, proceeded to the eastward with another party as far as the Coppermine River, without any difficulty. Franklin says that the natives informed him that, from the top of the hills at the mouth of the Mackenzie River, no ice was to be seen for two months of the year, *i.e.*, in August and September, showing the powerful influence of these rivers upon the ice. It was the current from this river and its thermal influence which enabled M'Clure to reach Banks' Land, and had there been other large rivers to the eastward, with no land to obstruct their discharge northward, would have enabled him to make the passage between one ocean and the other.

The months of August and September are, I think, the best months for explorations along the shores of the Arctic Ocean. American whalers have passed to the eastward of Point Barrow, and taken whales as late as the 15th of September, seeing no ice to the northward except in the immediate vicinity of Point Barrow. Whales have also been taken as late as the 12th of October in latitude 71° N.

Deshnew, it is certain, in 1648, sailed from the mouth of the Kolyna, along the coast of Asia, and passed through Behring Strait to the Anadyr River. The account of this voyage, though vague and

uncertain in regard to its details, yet established the fact of the separation of the continents of Asia and America.

Shalaurow, Billings, and others, attempted exploration along this coast, but were unsuccessful, and some of them perished in their attempts. When we consider the scanty facilities and rude structure of their vessels, we cannot wonder at their failure.

With our modern improvements in the structure of vessels and appliances for propelling them, what to the navigators of two hundred years ago appeared possible, should to us appear and be of easy accomplishment.

That a vessel properly fitted for the purpose can winter in safety at almost any point along the shore, is proved by the experience of Captain Collinson, in the *Enterprize*, who twice wintered eastward of Point Barrow, once at Camden Bay, where there is no protection from the north, except the ice which may be grounded seaward from the vessel.

That the passage from the Pacific to the Atlantic Ocean will be accomplished by one of the routes which I have indicated, I have as much faith in as I have in any uncertain event in the future, and much more than I had fifteen years ago, in the success of the Atlantic Telegraph.

In conclusion, I submit these remarks to the public, and while deprecating criticism on any verbal inaccuracies, would invite discussion in regard to the views advanced, or the feasability of the routes proposed. Although this route will be of no great importance to commerce as a transit from one ocean to the other, yet could the passage along the coast as far as the mouth of the Lena be successfully made every year (which I think probable,) it would be of great benefit in developing the resources of Northern Siberia.

Yours, truly, THOS. LONG.

Honolulu, January 15th, 1868.

NOTES DURING A VOYAGE BETWEEN ENGLAND AND THE BLACK SEA.

(Continued from page 104.)

AN "establishment of the Port" is a desideratum at Constantinople, for the observations to be made here would be of unusual interest, especially those upon the *variations* of the current setting down from the Bosphorus, its different rates according to its depth below the surface, and also as to whether there exists a *counter current* similar to that in the Straits of Gibraltar.

That there are rare occasions when the current sets *up** the Bosphorus

* A series of such observations was published a few years ago by the Admiralty, and, we believe, is still in use in H. M. Navy.—ED.

I have mentioned in a former paper, and it would be a very interesting investigation to discover the cause of such a phenomenon. With our men-of-war in all waters it ought not to be too much to expect to find their officers taking an interest in such matters, and making known the results of their observations, for I hold that it should be the desire and effort of every intelligent educated and experienced seaman to benefit the whole nautical brotherhood, by some useful result of his experience and intelligence, and I can only say that those who neglect to do so when opportunities offer, not only neglect a duty to their profession, but also lose a very great enjoyment, and the advantages of a highly useful exercise of their faculties. Speaking figuratively, no one should desire more than the seaman to leave "a guiding foot-print in the sands of time"—some useful and honourable mark of his life and toil upon the wide ocean, to be held in grateful memory as long as there are ships to sail, and business to be done in the "great waters."

Like an unclean bird in the eagle's nest, so is the Turk in Constantinople! How has this once Christian imperial city become the metropolis of a people who despise the creed of its imperial founder; and how is it that the dark shadow of Mahomet's throne has so long rested on the spot where the cross was set up. How is it that the fairest and most fruitful parts of the earth are in the possession of a people who make a wilderness of a paradise, and an evil use of God's bountiful gifts.

Look at the condition of Turkey, Syria, Palestine, and Egypt, and let any one who has thought over the past history, and present state of these countries, say if any annals can exceed in blackness, cruel oppression, human misery and degradation, the dark story of these choice lands! And then again, to think what a strange complication and clashing of political interests among the Christian powers of Europe to have resulted in their going to war among themselves to defend such a condition of things, which owes its continuance only to their jealousies one of another. I remember being struck when in Constantinople at the sight of a decayed tree fenced round with an iron railing, for it seemed to me as being an apt emblem of the Turkish empire, having little inherent vitality, and only kept from the axe by an outer fence of jealous nations.

(It is observable that all Asiatic States are marked by visible decline, from the Bosphorus in the west to Burmah in the far east. "Ichabod" is the writing on every palace wall, and from my own observation I know how insecure the king of Burmah (who is the last remaining type of the old despot) feels himself to be on his gilded throne.)

Since the time that the Cross was struck down at St. Sophia's and the Crescent set up in its place, more than four centuries have passed away, during which period the star of Mahomet has culminated and declined, and is now sinking towards the horizon like a baleful meteor, whose track has been marked by splendour and ruin, and leaving no single beneficent beam of light on the earth.

If in the order of future events "Peter's Little Bark" shall again

visit these beautiful shores, the question arises, *what flag* will be seen flying at the main? Will there be seen blazoned on it the Latin Cross with the Triple Crown, or the Greek Cross with the Double Headed Eagle; or will it bear on its folds of light the Blessed Symbol only? and if so from what port will the "Bark" with such precious freightage take departure? Who in the present condition of Christendom both political and religious, will venture to attempt an answer?

Ah! if this "Bark," on her celestial mission, were to be seen hovering off the coast of Europe, and the flag of every nation were lowered to her, what would become of the armour plated Fleets, and the iron faced Forts and defences with their "wonderful guns" among which are some, "a single one only, costing what would found an hospital!" What a condition for nations calling themselves Christian, with their hundreds of thousands of men under arms, withdrawn from the useful and healthful occupations of life, and all this too in what is called a time of peace!

Belay there! pipes the boatswain with his mates as the topsails are hoisted, and our ship sails slowly out from the Golden Horn into the Sea of Marmora, while the setting sun sheds a crimson light upon every dome, and minaret, and tower in the City of the Sultan, and upon the forest of tall masts of the ships of war of four nations—upon the opposite shore of another continent—upon Scutari and its crowded hospitals filled with the wounded and the dying—and upon the sea, making it beautiful with the tints reflected from the sky until the whole scene was covered with a glory of rich light, which, like a dissolving view, faded away while being gazed at, as the loud boom of the evening gun echoed from shore to shore, mixed with the strains of a hundred musical instruments in the Fleet, completed the enchantment of a vision of beauty and sadness such as is not often seen, and not to be forgotten.

Soon all is changed. The sun has sunk in the western sea, shedding his last ray upon the gilded crescent over St. Sophia's, and as the robe of night, spangled with a thousand stars, falls upon the seven-hilled city, there is seen dimly shining upon it the beams of a *waning moon*—fit emblem of its present condition, of its "decline and fall."

The wind falling light we had to anchor to prevent our being drifted among the Prince's Islands, and the sea became like a mirror, reflecting not only the brighter stars but the entire heavens, and so perfect was the illusion that on looking down over the taffrail it seemed as if the ship were floating in æther, while far below, in unfathomable depths the constellations were seen shining with a subdued and unsteady light. The night was so still that the "All's Well" from the Fleet could be heard, and as the first streak of day dawned the call of the muezzin from the different minarets reached us over the sea as we weighed anchor with a light breeze, and steered for the Dardanelles.

Farewell, O city! "Beautiful for situation!" May the first beam of morning, now shining upon your false symbols, once more shine upon the true—upon the Cross—restored to its place high over all in

your midst, and no more to disappear until its Great Work is finished, and then may you be found beautiful within as well as from afar, and with a name for truth and greatness, so as to be honoured among all nations. W. C. P.

Of the adverse events in the history of the Church during the fifteenth century, Mosheim relates the following:—*Ed. N. M.*

"In the countries of the East, Christianity daily suffered a diminution of its glory and prevalence by the inroads of the Mahomedans, both the Turks and likewise the Tartars, who had embraced the Koran. In Asiatic Tartary, among the Moguls, the inhabitants of Tangaet and the adjacent nations, the ground which had long been occupied by the religion of Christ, was now the seat of the vilest superstitions. Nor were even the vestiges of Christianity anywhere visible in those vast countries, except in China, where some feeble remains of the Nestorians glimmered faintly amidst the thick surrounding darkness. For it appears that so late as this century the Nestorian patriarch in Chaldea sent certain men to Cathai and China to preside as bishops over the churches existing, or rather lying concealed, in the more remote provinces of that country. Yet even this little handful of Christians must have become wholly extinct in the course of the century.

"The lamentable overthrow of the Greek empire brought incalculable evils on the Christians in a large part of both Asia and Europe. For after the Turks under Mahomed II. (a great prince, religion only excepted) had captured Constantinople, in the year 1453, the glory of the Greek church was at an end: nor had the Christians any protection against the daily oppressions and wrongs of the victors, or any means of resisting the torrent of ignorance and barbarism that rushed in upon them. One part of the city of Constantinople the Turks took by storm, but another part of it surrendered upon terms of capitulation." [In this account, says the English editor, Dr. Mosheim has followed the Turkish writers. And indeed, their account is much more probable than that of the Latin and Greek historians, who suppose that the whole city was taken by force and not by capitulation. The Turkish relation diminishes the glory of their conquest, and therefore probably would not have been adopted had it not been true.]

"Hence in the former part of the city [that taken by storm] all public profession of Christianity was at once suppressed; but in the latter [that which fell by capitulation] during the whole century, the Christians retained all their temples and freely worshipped in them according to their usages. This liberty however, was taken away in the time of Selim I., and Christian worship was confined within very narrow limits. The outward form and organization of the Christian Church was indeed left untouched by the Turks: but in everything else the Greek church was so straitened and cut up, that from that time onward it gradually lost all its vigour and efficiency under them. The Roman Pontiff, Pius II., addressed a letter to Mahomed II., exhorting him to embrace Christianity, but his communication was equally destitute of piety and prudence." [In a note, the editor has

added, the letter is the three hundred and ninety-sixth of the printed letters of Pius II., and occasioned a debate between the French Protestants and French Catholics as to its piety and discretion. The Pope promised to confirm the dominion of the Sultan over the Greek empire, and assured him of the *respect and esteem of the Christian world*, by which he would become the greatest prince on earth, if he would only be baptized and make a profession of Christianity !]

On the relative value of Free and Slave Labour

In the Province of Ceara, on North Coast of the Brazils, 1867.

As the subject of slave labour is always of great interest to a large portion of the inhabitants of the United Kingdom, I send you the following information obtained by me while in the Province of Ceara.

The Province of Ceara has a population of 300,000, of which not more than about 6000 are slaves. It is consequently considered all but a free State. The staple products of the country are coffee and cotton, nearly the whole of which is cultivated in great quantities by free labour. While staying at Mariguana, about twenty miles inland from Ceara, with Senhor de Silva, who kindly assisted me in collecting any information I wanted, I visited both his and other estates situated in a part of the country much resembling the hilly parts of Jamaica. The coffee plants, however, here are not cut back in the same manner as in Jamaica, but allowed to grow almost wild, from the mere fact of the land being of but little value. On nearly all his estates free labour is employed, but on the others the labour is partly free and partly by slaves. The average wages paid by him was about two shillings a day, the labourer finding his own food and lodging. If the master boarded him he was paid less, although in either case the expense was about the same. The average expense of the slave, after the first cost, or rearing, lodging and feeding, and taking care of him when sick or used up from age, all this amounts to about the same; as the masters take great care of their slaves and are very kind in their treatment of them.

For the cultivation of the sugar cane slave labour is generally preferred to free, in consequence of the great difficulty in getting free labour at work in the cane fields. For then the free labourer gets his wants amply supplied by the much lighter work of the coffee or cotton plantations. The Province of Ceara has improved greatly of late years, being free from those partial and slight outbreaks of slaves that take place in the other provinces. Many of the owners of large estates are very liberal and enlightened men, who have travelled or been educated in Europe, and send their sons there, or to the United States to be educated.

The small number of slaves in Ceara is principally the effect of the

far sighted policy of the Legislative Assembly, which, seeing that slavery was doomed, determined to do away with it themselves by degrees, and they have so far succeeded, that, should slavery be abolished in the Brazils, their province will not feel any ill effects from it, while others will be struggling with the same difficulties that Jamaica had, and the United States are now contending with.

The town of Ceara is clean and well built, with wide streets, lighted with gas, and supplied with good water by an English Company from a spring about two miles from the town, and in 1866 contained 16,000 inhabitants. It is very healthy, and the climate is much cooler than that of the coast to the westward, as it always has a good breeze from the eastward. The harbour is protected by reefs, and will take vessels drawing thirteen or fourteen feet water. There is a wharf for loading lighters in fine weather. In bad weather every thing has to be sent off in Catamarans, which are very large, good and well managed, and will carry about a ton of cargo. But it is seldom that passengers cannot land at the wharf from boats.

The value of Exports from Ceara in 1866 was £360,000, consisting of cotton, rubber, Carué de Ceara, coffee, etc. The Imports were £236,000, nearly all the shipping being Brazilian or English. Of course Ceara, like the rest of the Brazils, suffers greatly by the present war, as the country people will not bring their produce into the town for fear of being pressed for soldiers.

In obtaining the statistics and other information, I received great assistance from Mr. Studart, the Vice Consul, and Mr. Forster, the Manager of the Water Company, who did all in their power to make our stay agreeable and interesting to us.

Senhor de Silva, of Mariguana, who I have previously mentioned, is a fair representative of a Brazilian country gentleman. He belongs to a good Portuguese family, and settled in the country about forty years ago. The country gentlemen are noted for their hospitality and courtesy to strangers. In their receptions, the stately ceremony of the last century is preserved, which keeps up a high tone of manners, as they are very sociable, and fond of visiting and gaiety.

From various causes the number of slaves in the whole of the Brazils is on the decrease. Slaves in most of the provinces are allowed a certain amount of time in the week to work for themselves, and thus gradually to buy their own freedom. Slaves are also sent to the war as substitutes for free men, and become free on bearing arms, and lastly, many slaveowners who release ten slaves to serve as soldiers have the title of Baron given them for life.

B. W. B.

As regards our Merchant shipping, in Brazil you have the ordeal of health visits, police, and custom-house searchers, before you can even leave the ship, and if a vessel arrives after dusk, no matter where from, coasting or otherwise, she must remain till morning for the visit, after which she is a kind of custom-house prey, watched and pounced upon in every possible manner, if all is not found to be strictly in

accordance with the long string of regulations, numbered like a criminal code; and woe betide the unfortunate shipmaster or merchant importing goods who innocently falls into the trap laid for him. It is a case of heavy fines, damages, and often confiscation of ship or property, although it can be clearly and satisfactorily proved that no one is to blame in the matter, and that there has been no fraudulent intention whatever. The stipulations of the custom-house code are being continually infringed, and yet, like the laws of the Medes and Persians, it altereth not. All this is very sad, and unworthy of a country that looks to commerce for its intercourse with Europe, and as a main source of revenue and social progress.

VOYAGE OF H.C.M.S. NARVAEZ

From Manila to China and Japan in 1864.

(Continued from page 185.*)*

WITH the assistance of the superior of the Mission, who volunteered to attend me as interpreter, I made arrangements to pay a visit to the Governor (Chifu) of Teng-Chau, and after obtaining the assurance that he would return the visit, I proceeded with this object on the first of June, accompanied by the officers of the ship. The Governor received us in his palace, a strange although not unpleasing collection of buildings, surrounded by extensive gardens, at the entrance of which, the lions carved in stone were seen (but the Chinese lion is a kind of imaginary animal, more resembling a tiger or a cat than a lion), symbols of the power of this high official dignitary. He was a mandarin of the third class (with the transparent blue button) named Yu-lau-yay. According to the information of the missionaries, and as I otherwise learnt, he is related to the imperial family. Certain it is that, judging from what is said by the European residents in China, the family of the Emperor has a certain connection with our great forefather Adam, for his very ancestors are innumerable. Yu-lau-lay, like all high Chinese functionaries, was particularly attentive and ceremonious beyond all conception. But courtesy in China is carried so far that its exaggeration becomes tedious. The Chifu received us most courteously with salute of artillery and a large amount of preparations; kept us above two hours, and set before us refreshments, consisting of things which might be eatable, and from which His Excellency Yu-lau-yay condescended to help me with his own fingers. A Chinese banquet in these days is no novelty; but it is always a tremendous affair, and it may be added that for European stomachs it is no joke. Ours commenced with the pips of watermelons, followed by fruit and sweetmeats, continued with meats and cockles, and concluding with an infinity of things it would be difficult to describe.

Some productions of the Chinese culinary art seemed to be built up with condiments of oil of resin, and were served in various forms, redolent of various odours and of as various colours; of all which it was necessary to partake to avoid the appearance of a want of courtesy, and all these preparations had to be washed down with abundant libations of *sam-chu*, a warm kind of beverage extracted from the grain of millet. And repeated cups of tea with which we were persecuted were no less necessary throughout our visit from its very commencement.

On the following day the Chifu came on board the *Narvaez* to return the visit, attended by his principal officers, civil as well as military, bringing with him his son and a large company. They were conveyed on board from the beach by our boats, received with salutes of artillery and honours, etc., due to his station, and remained on board with considerable satisfaction for about four hours. He visited leisurely every part of the ship, stopping a considerable time at the engine-room, wondering all the while at the strange complication of iron and bronze. He witnessed the manœuvering of our artillery and firing shot, and would have fired a gun himself if he had had sufficient power to do so. The delicate small hands of the aristocratic mandarin, that might be compared with those of the most refined European lady, in fact, exactly similar excepting in the length of the finger nails, to those of the most idle American creole, could not exert sufficient strength on the line to make the hammer fire the fulminating powder. For after repeated attempts he was obliged to give it up. The cord being transferred to one of his military officers, a burly looking Tartar mandarin, whose huge hat was embellished with a peacock's feather, besides the blue button, he declined the honour of firing the gun without trying. And at length, Yu-lau-yay was not allowed to go away without each of his party carrying with him papers of sweetmeats made by the barbarians, that pleased them much, adding, of their own accord, that they would keep them for their children. But it is quite certain, as to these dulces, they liked them much better than their own, trifling as they were, for those which they had given to us the day before were horrid things, and deserved any name inferior to that of dulces (sweetmeats).

I think I may safely say that the Chinese Governor was highly gratified by his visit to the Spanish ship. On taking his leave of me, he told me that he was desirous of giving me a dinner at his own house, and of introducing me to his family. But, as to have accepted it would have led to the detaining of the ship (apart from the fact that a second treat of the kind which I had already received, might have been too much for my stomach), I excused myself by shewing him that I was under the necessity of sailing the next day, as it really was my intention to do before this visit. That evening, an inferior mandarin, the tutor of his son, who had also been on board in the morning, brought me some bunches of flowers and leaves of tea, sent to me by the Chifu's family. I cannot say how this piece of gallantry arose, for certainly there is no mention of it in any book of Chinese etiquette that I have met with.

At noon on the following day (3rd of June), we sailed from Teng-Chau, and laid the ship's head for the Great Wall. On the 5th, the Coast of Tartary was in sight, and in the evening, we dropped anchor off the Great Wall.

This extraordinary monument, which is doubtless the largest work ever executed by the hand of man, is known to have been built twenty centuries before the time of the Emperor Che-Hoang-Ti. Five hundred thousand workmen are said to have been employed on it; but in my opinion this number of men, and space of time, are too insignificant to realize the fact of an enormous fortification more than 1300 miles long being built, that begins at the sea shore, stretches over plains, crosses rivers, winds up mountains, traverses deep, extensive valleys, and vanishes in central Asia, without its line being broken more than in one place in its whole length by the Amarillo (Yellow) river, over which it could not pass even by a bridge.

Until very lately, Europeans could only obtain a very vague idea of this wall, but its reality was known and also that it was no fable. Travellers there were who have crossed Asia, who have looked on it as an impossibility, and the coasts of the great gulf of Liau-Tung, where the wall commences, were entirely unknown until 1793, when two English ships of war *(Discovery* and *Alceste)*, navigated its northern part, and at a distance of eight or nine leagues from the shore distinguished the towers of the great wall. The two wars with China, and more especially the last, along with some hydrographical work executed in 1859 and 1860, have made the gulf of Liau-Tung known, but up to the present time, the number of Europeans who have trod the Great Wall is very small indeed.

The French ambassador, Baron Gros, after signing the treaty of 1858, visited it, going there in the *Pregent* steamer. This vessel approached it from the Chinese Coast, that is, from the inner side of the wall, and had to anchor two or three miles from the coast, in consequence of the shoals on that part of it. The French Embassy landed there with much difficulty, for the boats could hardly approach the shore, and their landing was at a great distance from the wall. But the people of the adjacent farms, who had collected to see the steamer, opposed themselves all they could to the landing of the French. Having assembled to the number of 300 on foot and on horseback, they hastened to impede their progress, obliging them to halt where they had landed; and after a long and useless conference, the Baron had to return to his vessel to avoid coming to blows, and not to compromise his dignity by a mere excursion for the sake of recreation and curiosity.

We ran along the coast of Tartary with the intention of avoiding the rocks which had prevented the *Pregent* from approaching the shore, and finding it all clear, anchored in less than six fathoms water at less than half a mile from the eastward of the eastern end of the Great Wall, the outside of which we saw, that is facing Tartary. In that part the shore is particularly clear of danger, and I did not anchor nearer because we were under sail, and the wind fell to a calm when I had reached that distance.

The Great Wall begins at 150 yards from the shore which forms a small cove like a horseshoe, and contains a considerable extent of plain. It forms a sort of redoubt which defends the end of the wall from the sea. From this the wall takes a N.N.W. course across a plain to the interior. At a certain distance it meets mountains about two thousand feet high, which it continues up, making zig-zags over them even to their summits, beyond which it becomes invisible from seaward. The length of it that we saw from the anchorage to the mountain summit was about eight or nine leagues. The redoubt where it commences throws out a ridge which extends to the beach and even penetrates the sea below the line of low-water, so that all communication by water is cut off between Tartary and China. Nevertheless, with the lapse of time and the want of careful attention to it, sand has been accumulating against the wall in some places near the coast so much that it is easily crossed, not only by any one, but also by animals.

In a work recently published *(Souvenir d'une ambassade en China et au Japan)* by M. de Mogas, collected by the embassy of Baron Gros, it is said that the wall descends to the sea by two spurs or parallel walls. This is not the case, for there is no other spur than the end above mentioned. The mistake no doubt originated from the distance and the position from which the French officer saw it. I have also passed over the place where the *Pregent* anchored, and it appears, in fact, from there that one of the faces of the redoubt was the other spur that projects to the sea.

At one of the angles of the redoubt and on the wall is a pagoda of two stories, the interior of which is nearly in ruins. The Chinese are accustomed to place inscriptions everywhere. The tablets and slips of paper with sentences and verses of their poets seem to adorn their buildings as they do our own pictures, etc. Pursuing this custom, the walls of this pagoda are ornamented with huge slabs of black marble, some of them remarkable from their enormous size, full of crabbed writing in lines from top to bottom that, in my entire ignorance of Chinese, I had not the power to decipher. Perhaps they recorded the name of the builder, and possibly the date when the work was commenced, bearing in mind the character of the Chinese, or it might be perhaps nothing more than a copy of some maxims of Confucius or some of his commentators. With some small difference the wall has much the same appearance as other walls which I have seen surrounding the principal cities of the Empire.

It may be concluded that all the Chinese fortifications belong to the same date, if we did not know the repugnance or rather the horror with which in this country all innovations are looked on. Whatever may be the reason, trifling or important, or for convenience, any alteration is thrown aside without consideration, whenever it differs from the established custom of centuries. In this country where everything even the most trivial, for instance, the mode of salutation, is regulated by antiquated laws, and therefore is respected as every thing of great age even involuntary; where many centuries have

stamped it with the air of perfection, as well in moral as in material matters, and where it has been handed down from each successive generation; where this belief is still prevalent, rooted in the innermost heart, without being sufficient to put a stop to European communication, but considered as good faith in China, alike by the governed as by the governor, as monstrous or demoniacal; where the arts and sciences of Europe are systematically rejected and considered as useless and prejudicial; in such a country which requires things to be forced, and every thing is the same, all is equal, there is no possibility of improvement, of any kind of innovation! Laws and customs are directly opposed to all. Even the organic constitution of this ancient society, whose fundamental principle rests on its respect for antiquity, on its veneration for the wisdom of its ancestors, repels the idea of any possible improvement.

From the foregoing, it follows that in China every thing is copied, for there is nothing original to be found there. The infinite number of vessels navigating the creeks and rivers of that country are similar to those which did the same above two thousand years ago. All their towns and buildings are similar, and it may be truly said, that he who has seen one has seen all. Their admirable system of canals, the net work of which covers the whole country; their ingenious mode of watering the ground so that the most out of the way patch of soil may be cultivated; their roadways for facilitating the intercourse of their huge population are all generally applied everywhere. The implements of cultivation, their mechanical tools, and the produce of industry are identically the same throughout the Empire, notwithstanding the diversity of its climate. Their dress is uniform in colour, size, and figure, and is similar to that worn in the oldest of time. In fact, briefly it may be said that in China everything is standing still. It may almost be said, without exaggeration, that the whole human race of people in China are even cast in the same mould. So complete is the resemblance of the Chinese to each other, and so slight the difference is there in physiognomy from each other, that in the rest of the races of the world, any one will serve to distinguish it from another throughout the whole species.

One of the results of such a state of things is, that the great Wall of China is necessarily of the same kind as those at Shanghae, Teng-Chau, Tien-tsing, or any one of the other 1717 fortified cities of the Empire. The outer part of the wall that fronts Tartary is built to a certain height with black stone, looking like slate, and the rest of some dark coloured bricks, not burnt.

At intervals of three or four hundred paces, there are quadrangular towers which are, in fact, the bulwarks of the long curtain. All those that we saw were of two stories and built of granite. The first have on each face three eye-shaped loopholes (there being altogether nine, three looking out direct from the front face, the others out of each face flanking the wall), and the second story has a platform with turrets. The whole front of the wall is thus turretted, and between each turret there is a granite block with a hole in it for the purpose of receiving

a swivel. If these are really intended for that purpose, which seems probable, and the wall has to be prepared for resistance, this species of artillery will be required for many hundreds of miles.

On the inner side of the wall which looks toward China, it is entirely formed of brick. The whole is filled with earth and the upper part paved. But the inner face is somewhat deteriorated both by the effects of the weather, and also by the people of the neighbouring villages, who seem to have acquired the habit of using the bricks from the wall in building their own houses. The towers in some parts seem also to have suffered, but generally speaking the work is in tolerable preservation.

It is very well known that originally it had a wide ditch, the remains of which are yet apparent. But the want of ground in China is great, and the farmer's plough has invaded it up to the very wall.

As soon as the vessel was anchored, we naturally proceeded to land in order to set foot on the great wall, and we landed on the spur which enters the sea from the boat alongside of it, and found ourselves upon it without having touched the strand.

In truth, neither the Chinese nor the Tartars, who were soon at hand, looked on our sudden appearance with any satisfaction. But perhaps considering, that the *barbarians* were not only numerous, but also well armed, and seeing that the only harm we were doing was merely inspecting the work, they gradually became civil, and our visit was concluded on very friendly terms. In fact, the great desire in the whole celestial Empire for the Mexican dollar contributed wonderfully to bring about this state of affairs, and after some small mercantile transactions, we found ourselves quite as much at home as we should have been in our own country.

On the wall of one of the curtains, we had read from on board the ship some characters painted large and conspicuous, which said, "*Arcona, Konigta Preusse Tregatta.*" The demon of vanity prompted by this bad example, prompted us to leave also the name of our ship in similar character painted on this wall of some twenty centuries. On the following morning, therefore, we landed with some white paint, and on leaving our anchorage in the evening, we read the following also on the great wall, "*Narvaez. Corbeta de su Magestad Catolica: 6 Junio*, 1864."

Meanwhile, I began to entertain some anxiety about water for the ship, an article rather difficult to be found in the north part of China. At Shanghae the water of the river is all that is to be had, and which Europeans have had to set aside. Or they always mix it with wine (the most common mode of using it), or perhaps they only drink it mixed with soda or beer. But there is scarcely any drinkable water in the whole gulf of Pechili, and what is found is generally bad. The Chinese themselves seldom use water by itself, and possibly this custom has, with some reason, proceeded from the bad quality of the water in the whole Empire, especially in its northern part, and the necessity there is for always boiling it for the sake of health.

We had not been able to get any water at the Miau-Tau islands, nor

yet anywhere in the vicinity of the great wall. But having learned that it was to be had at Liu-Sia-Kwang, some seven leagues from here, we transported the ship to that place in the evening of the 6th of June, using steam as there was no wind.

Liu-Sia-Kwang is a trifling small village occupied by rustics, the roadstead is good, and a vessel may anchor half a mile only from the shore. Here there are two wells of good supply, and although the water may be disturbed and somewhat muddy, yet it is the least insalubrious that is met with on the coast; and from these wells, although not without some trouble, we were enabled partly to supply our want. But this business detained us five days, in which interval the ship was visited by some mandarins. They resided, however, at Nan-tai-ho, a town close by, who, having heard of the arrival of a barbarian ship full of wonderful things, determined on seeing her with their own eyes.

At this visit, I determined to satisfy myself about a trait of Chinese character, which shews their national vanity. I had observed this trait myself on several occasions, but was unable to account for it from not knowing details. It is with this view that I mention this visit, for to record all that we have received in the course of our cruize, they would form a very long list.

The Chinese imagine that their spoken language is not understood, but they cannot imagine that it is neither understood when written. The difference in the language spoken in the celestial Empire, where the Chinese idiom of Canton, another of Fo-kien, and another of Pechili may be understood among the people of those places if by a Spaniard, a Frenchman, or an Englishman; the generality of their ideal writing which is the same not only throughout China, but also in Cochin China, and even in Japan, where it is very general; and lastly, the entire absence of all geographical knowledge, that makes the Chinaman believe that China is the whole world, and that beyond China there is nothing whatever, are the causes which united have given occasion for those ideas. It was easy to suppose that my visitors would express themselves in their native language which to me was no more than a collection of sounds more or less discordant. The best mandarin, seeing that however much they might talk we could not understand them, adopted his writing materials, with which every proper Chinaman is always provided, to judge by what I have been enabled to see on very different occasions. Writing something perhaps very good on their red classic paper it was presented to me in a very courteous manner to read: half-an-hour's attempt to do this entirely failed, when a feeling of satisfaction shewed itself in their faces as that of a person who had unravelled some important difficulty. But they were amazed when they found their attempts at explanation had not been attended with the results they had desired. At first they would not believe it, imagining that I was not in earnest. I must confess that on making them comprehend that their gestures were much better understood than their writing they entertained a very poor opinion of my comprehension! Their astonishment in fact was so great that they appeared to be lost in thought. Perhaps they con-

cluded in the profundity of their imagination that I was under the impression that the barbarian mandarin arrived from some unknown heaven, crossing the wide sea, was so barbarous that he not only could not understand Chinese but did not even know how to read.

Our watering being finished, we sailed from Liu-Sia-Kwang on the morning of the 11th of June, and shaped our course for the roadstead of Pei-ho to learn what the state of affairs was with our legation.

Hitherto the whole of our cruise had been highly satisfactory; but on this passage a very disagreeable event took place.

A Chinese junk ran foul of us at eleven at night, carrying away our jib-boom, the flying jib-boom, and also the bowsprit cap. And it was necessary to get clear of her quickly, lest she should carry off our starboard boat as she passed our side. This was an extraordinary event, inasmuch as the junk had been seen in plenty of time, and the course had been altered to avoid her, uselessly indeed, before she was upon us. Besides, the night was quite clear and our lights were burning brightly in their places. And the junk had shortened sail as soon as she struck us; and it was considered by our people that the Chinese had intended to board us, but on seeing so many hands, whose appearance was produced by the shock, instead of doing so had concealed themselves below.

It is very well known that there are plenty of pirates on the Chinese coasts. In spite of the active proceedings of the English ships of war in suppressing them, and a few years ago destroying a fleet of sixty-four piratical junks containing some three thousand men, pirates infest these seas. Last year a Hamburgh ship was plundered and sunk only a short distance from Hong Kong, and lately (July 4th), a Spanish brig, the *Ilocano*, even in the port of Hong Kong, under the English forts, and was only saved by the efforts of her crew. Two of her seamen, wounded, were placed under the care of the surgeon of the *Valiant*, when the *Narvaez* arrived there on her return from this cruize.

When the *Narvaez* is at sea under sail with her guns run in, she has much the appearance of a clipper merchant ship rigged as a barque, and seen from ahead she has even more that appearance, when her chimney is not seen, on account of the sail, she might certainly be taken for what she is not. Besides, we had been benighted at a short distance from a Hamburgh barque of the same size as the *Narvaez*, which being near our bows at sunset remained astern of us during the night, and kept in our wake about two or three miles from us. Thus it was possible that the Chinaman had mistaken us for her. On having the crew of the junk counted, we found she had forty-seven hands.

As we resolved to detain her the fires were lighted and we took her in tow for the Pei-ho, where we arrived the following July 12th. I wrote to our minister, informing him of the event, requesting that he would ascertain whether the vessel was a pirate or not. I sent with the letter to Tien-tsing, one of the principal men of the junk, that he might be taken before the Chinese authorities, that they might determine whether or not she was legally employed. It appeared however that at a small village, Taku, just within the mouth of the

Pei-ho, neither the vessel nor her crew were known. If she proved to be a pirate, the escape of the man sent to Tien-tsing was of little consequence, as we had forty-six others on board of her; and if she proved not to be one, the Chinese authorities would take care to make it known to our plenipotentiary, from whom I should receive notice accordingly. So having sent off my messenger on the evening of our arrival, we set about repairing our damages, making a new cap, and fitting new spars. And awaiting a reply from Tien-tsing the junk remained anchored on our quarter in view of sentinels.

We soon received accounts, by no means favourable although vague enough, on the affairs of our legation. There was no specification of events, but it was said that things in general went on badly. Therefore after three days I determined on going myself to Tien-tsing, as much on this account as from having no answer respecting the junk. Besides it was necessary to consult the minister as to the disposal of the *Narvaez*, to decide in fact whether she should remain there, or return to the Philippine Islands.

Leaving the *Narvaez* therefore, and accompanied by one of my officers, we took a country vehicle, one of those vile machines purposely constructed to shake one's bones, in which the traveller is compelled to rest on mattresses to prevent them from some severe injury. We started at about dusk of evening, and in the morning found ourselves at Tien-tsing, after crossing the plain traversed by the waters of the Pei-ho, and finding a large collection of small villages, in some of which the horses of our vehicle were changed.

It is well known that Tien-tsing was thrown open to trade in virtue of the treaties of 1860, after the occupation of Pekin by the French and English troops. It is about one-third the distance from the sea that Pekin is, and is a city of great importance. The population of it is 700,000, and according to report this number is not exaggerated, so that Tien-tsing is of as much importance as Shanghae. It is here that the great artery of Chinese interior communication terminates: the Imperial canal which setting out from Hau-Chau extends through four hundred leagues or more to end at Pekin, which city receives by this communication the products of the southern provinces.

Our legation having established itself at Tien-tsing by Chinese treaty, everything it appeared had gone right, and the report which reached the *Narvaez* proved to be untrue. The principal difficulties had been overcome, and I learned from the minister that everything went smoothly. With respect to the junk, the Chinese minister who was treating with ours had shewn that she was no pirate, and that her running foul of the *Narvaez* was accidental, our legation having claimed payment for the damage she had done to the corvette; a matter to which I had not alluded, having detained her on the suspicion that she was a pirate. The detention had given rise to a correspondence, and such was the state of affairs when I arrived at Tien-tsing. At length it was agreed that the junk should be given up; the business being settled, although not yet allowed to go free but to be delivered to a mandarin at Taku, who, in fact, was sent to receive her by the Chinese minister.

Then with reference to the operations of this ship, having installed the legation, and their affairs going on quietly, it was determined that we should sail on our return to the Philippine islands leaving the anchorage off the Pei-ho as soon as the time arrived by my orders.

We therefore left Tien-tsing on the 19th, and reached the ship on the morning of the 21st. The junk was sent to Taku where the Chinese mandarin awaited her, and the *Narvaez* was made ready for sea.

An American View of the importance of Isle St. Thomas.

In a former number we have preserved the opinion of Vice Admiral Porter (U. S. N.,) on the purchase of Isle St. Thomas (March, page 127), since which we have met with the following ample *reasons* why it should become a part of the United States territory.

The *Washington Chronicle* of the 13th of January published a letter written by Mr. Yeaman, the United States minister at Copenhagen, to a member of Congress, under date of December 12th, giving some views as to the purchase of St. Thomas. Mr. Yeaman says :

After a most difficult and laborious negotiation of many months, I have lately, under directions, concluded a treaty with Denmark for the cession of the islands of St. Thomas and St. John to the United States, after the vote of the people of the islands. I suppose there is no doubt the Senate will ratify, and it is believed the Rigsdag here can be got to ratify, though some Danes think the islands were sold much too cheap, and others are opposed in sentiment to all territorial cession. But the same mail that brings me your letter, brings the resolution of our friend Washburn upon the subject. I suppose the resolution was introduced and passed under the idea that the negotiation was still pending, and without knowing that the treaty had been signed a month before and was then in Washington. I can also believe that it was passed more as a general expression against indiscriminate territorial purchases than as a specific expression of the real value to us of the finest harbour in the West Indies, and that many gentlemen, including the honourable mover, upon fully investigating that point, would not hesitate to vote the appropriation (7,500,000 dols.) to pay for the two islands.

No one can possibly be more opposed than I am to territorial expansion for the mere sake of expansion. We have more territory than we can cultivate in the next two hundred years. But there are political, commercial, naval, and military reasons that may have a just influence upon us. Who can doubt that we would be better able to keep the peace, and stronger in war when it comes, if our neighbours beyond the St. Lawrence and the lakes were consolidated willingly with us ?

And who can doubt, for just and plain reasons, that we would be weakened by absorbing our neighbours between the Rio Grande and

the Isthmus? What would we have given—what would we not have given, for St. Thomas during the war, when Alabamas, Shenandoahs, Nashvilles, and Sumters were destroying our commerce, and having as free access as ourselves to the harbour and to supplies? And especially while capture of private ships and goods is still allowed on both sides, which you are in favour of and I am opposed to, what would we give for it when we get into a war with any great naval power? Consider its central and commanding position in the midst of the most important group of islands in the world—islands where all the great maritime powers have an interest; that it is the very best and most defensible harbour in the West Indies, if not in the whole world; that in war both belligerents have equal access to it as a neutral port and depot of supplies, and that we cannot strike an enemy in neutral waters, nor even pursue him, if so notified, until twenty-four hours after he has departed. Consider the very great advantages of our having the exclusive possession and control of such a port in such a region; the advantage of keeping our enemies out; the advantage of a prize court there, by which we double or treble the effectiveness of our cruisers in those seas, because they would not exhaust themselves by details of prize crews, and spend all their time coming one or two thousand miles for an adjudication. If it is said we already have access, so have our enemies while it is neutral; and if, by any European combination and alliances, Denmark becomes our enemy, we are excluded, and at best we cannot establish a prize court on neutral territory. You and your fellow-members of the House consider all these things, and I cannot think there will be any hesitation, certainly not a refusal, to accept such an acquisition at so moderate a price.

I have sent maps of the island and harbour to Mr. Seward and General Grant. One map sent to the Secretary of War is an accurate and elaborate survey of the island and the surrounding waters, showing the land-locked harbour to be surrounded by hills, even at its very entrance, which, with long-range guns, would command the sea for miles around. With only a little expense it can be made absolutely impregnable. As to its cost in time of peace, it would not be more than any one of the dozen or twenty forts on the Indian frontier; and as to its being incompatible with our institutions and form of government to hold a dependence not having enough people to be admitted as a State, it is simply a mistake. We have always had such, and we have them yet.

With each one it is a question of time and population. So it will be with the islands. If they ever contain population enough to be admitted as a State, they will be admitted; if not they will remain a territory, and as a territory they can be accorded all the local self-government which any state possesses, and, if necessary, as much as is compatible with the territorial sovereignty of the United States for naval and military purposes.

Congress could not surprise Europe more than by refusing to complete this affair, and more than one great power would be ex-

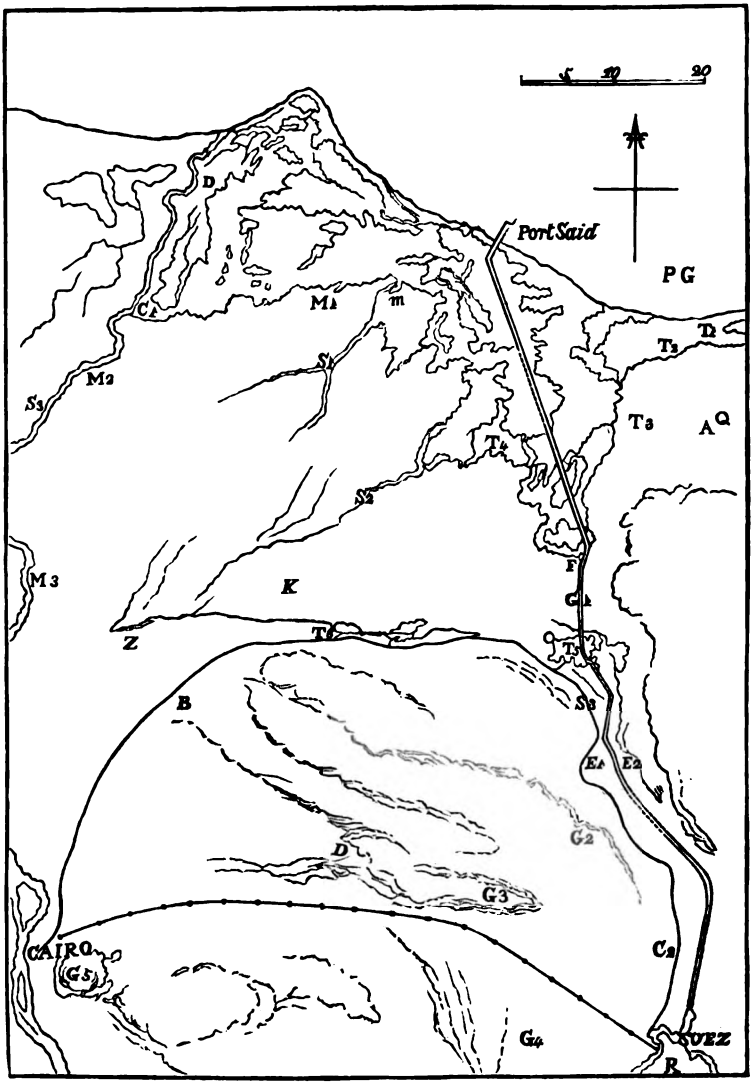
tremely gratified that it should fail. One must be in Europe, in diplomatic and political circles, to appreciate fully the view that is taken of it. It is regarded everywhere in Europe as an infinitely more valuable acquisition than *Walrussia.** Next to the Alabama claims and the French out of Mexico, it is considered Mr. Seward's best idea. I would not depreciate our Russian-American purchase. I think it worth the money, and should certainly vote it. But in Europe the treaty caused comment on account of its supposed political and diplomatic significance, while as an acquisition of territory it has been the occasion of a good many good-natured jokes. Not so with St. Thomas. That is a different affair. It is, to the European mind, an affair with a point to it; and to many the point is painfully significant. I cannot discuss the numerous and important questions which have arisen during the negotiation. The voluminous correspondence is in the keeping of the department, and much of it would have but little interest after the treaty is made. But if any gentleman thinks the arrangement was easily arrived at, or that Denmark was anxious to sell the islands, a half-day's reading of its history would convince him to the contrary.

The foregoing was probably rather intended for "Department" Archives than for the columns of the *Washington Chronicle*, but it is so complete an episode at an important juncture of the history of the island that the future historian will no doubt be glad of it, as well as the following concluding paragraph relating to our connection with the island, through the medium of a mail station.

The Royal Mail steamers now stop at Jamaica instead of St. Thomas. They only just call at the latter island to drop their inter-colonial mails and fill up with coal. Virgin Gorda, one of the Virgin islands, will probably be made the rendezvous of the steamers. In the first instance the steamers were made to call at Madeira to coal up, and then go on to Grenada, one of the safest islands from storms and convulsion; then they were made to go to Bermuda, because the British admiral was stationed there. This was a disastrous route, on account of the weather experienced on it. At length the increased demand for speed compelled the building of monster steamers, to run to St. Thomas, a distance of nearly four thousand miles, without stopping to coal. St. Thomas is the nearest island to Europe, and is the extreme point to which any steamer can run, at full speed, from Southampton without coaling. All spots where great deposits of coal are made are unhealthy, because the deposits are never cleared off. Rain percolates through the coal heaps, the foundations of which stand in a poisonous mixture of fluids and gases, which corrupt the surrounding atmosphere. The last Royal Mail steamer took out a large number of wealthy Antipodeans returning to New Zealand and Eastern Australia. They will get home nearly a fortnight quicker by the Panama route, than if they had gone by way of the Red Sea.

* Most probably Russian America recently purchased by the United States, is here meant.

PLAN OF THE SUEZ CANAL.



The Suez Canal.

In the present advanced condition of the works for the great canal that are going forward on the Isthmus of Suez, we are encouraged by the rapid progress which they are now making (promising as it is said, their completion in the course of the present year), to prepare a little outline plan which will serve to place the main features of the subject at least in some intelligible form before our readers. And as introductory to the subject we will briefly explain the various symbols to which we have resorted in this reduction of Mr. Lesseps' original plan. It has no other pretensions than those of giving the course of the canal, and a mere outline of the main features of water and land, the use of letters being adopted to stand in the positions of places, and thus explained. Beginning with the northern portion of our sketch with the shore of the Mediterranean, shewing the position of Port Said, we have

D.—Damietta, on the Damietta branch of the Nile.
M. 1—Menzaleh, to the east of which is,
m.—Matarich, both on the southern borders of the lake Menzaleh, through which the Canal passes from Port Said to the southward. This lake is full of sandy isles, the forms of which are constantly changing with the height of the water and the wash of the sea from storms, etc.
P. G.—Pelagian Gulf in the Mediterranean.
T. 1—Tel Gerah.
T. 2—Tel el Amarchina. Faramah. Ancient Pelusium. These have isolated heights on the border of the dryer part.
T. 3—Tel el herr.
Q.—Qutich.
A.—Aclameh, both situated among Sandy downs.
C. 1—Chirbine, on the Damietta branch.
M. 2—Mansourah, on the right bank of Damietta branch.
S. 3—Samanoud, on the left bank of the Damietta branch.
S. 1—Sane, the ancient Tunis.
S. 2—Salbick, close to which is Cassassine, the ancient Tacasarta.
T. 4—Tel Defenneh, on the southern shore of the Menzaleh Lake, at the mouth of the ancient Pelusium branch as well as Salbich.
K.—Korein.
G. 1—El Guisr village.
M. 3—Mit Canar, on the right bank of the Damietta branch.
Z.—Zagazin, at the entrance of the old Canal of the Ptolemeys.
B.—Bulbeis, on the right bank of the old Canal of Trajan.
T. 6—Tel el Onadie, the ancient town between the Canal of the Ptolemeys and the Fresh Water Canal.
T. 5—Lake Timsah, containing also Ishmailia, the capital of the Company.
S. 3—Serapeum.
E. 1—El mel Alli.
E. 2—El Ambak, called by Lesseps the basin of the Isthmus.
G. 2—Heights of Gebel Genof.
D. Dar el Beda. Palace of the Pacha.

C. 2—Great Shaloof.
G. 3—Heights of Gebel Awabel.
R.—Roadstead of Suez.
Between Cairo and Suez the line marked by dotted stations denotes the direction of the railway between those places, and the continuous curved line from the river at Cairo, passing by B., T. 6, S. 3, and E. 1 to Suez is the junction canal for navigation supplied by the waters of the Nile.
G. 4—Heights of Gebel Attaka, due west of Suez.
G. 5—Heights of Gebel Diouchi, next east of Old Cairo, south of the present city of Cairo. A petrified forest on the eastern slopes of these heights.

On the subject of the canal itself we shall now refer to the letter of His Grace the Duke of St. Albans, as it appeared last month in *The Times* newspaper. Our outline sketch serves to give, with the assistance of its letters of reference, the positions of most places of interest to our readers. It will be at once seen that the course of the canal from Port Said passes through salt water lagoons as far as the moveable downs of El Ferdame at E 1 on the plan. Thus much of the course being over land that is flooded more or less by sea water. Passing thence through Lake Timsah and the firm ground by Serapeum, it enters again on drowned land at El mel Alli, and El Ambak, and passes through what M. Lesseps calls his basin of the Isthmus, formerly occupied by the Red Sea, and now called the Bitter Lakes, from whence the severest work of cutting commences, as described by the Duke of St. Albans. The whole portion of the space between Cairo and the Lake Menzaleh is intersected by small branches from the Great Damietta arm, all flowing towards Lake Menzaleh, and these with the shores of that shallow lake, ever changing as they are in form and direction, render any attempt to represent them as useless as well as unnecessary. Our plan is provided with a scale of geographical miles. These may be considered as sufficiently near our English statute miles by adding to them a sixth part of any number that may be required.

The Duke of St. Albans, addressing the Editor of *The Times* says:—

"Sir,—I started last week for the works on the Maritime Canal, across the Isthmus of Suez, in the belief I was approaching an indefinite French project just sufficiently real to ground claims for indemnification or imperial arbitration upon. As I do not believe in England the present extent of these works is at all believed, and as I have heard regret expressed that none of the many English who have visited them have thought it worth while to make known the truth, I am induced to send you this account of what I myself saw, without hazarding an opinion whether it will prove a remunerative investment, which, I think, may fairly be left to be decided hereafter.

"'La Compagnie Universelle du Canal Maritime de Suez' was called into existence by the unfailing energy of M. Lesseps, a French diplomatist, until then unknown to the mercantile world, who conceived the idea of joining the Mediterranean to the Red Sea by a salt-water canal,

capable of being used by the large shipping of the present day. This every one knows. What every one does not know is the advanced state of these works, as patent to all who, like myself, have passed along the line from Suez to Port Said.

"The undertaking may be said to have been commenced in 1860; but the approved modes of carrying out such a work did not then exist, and the first years were necessarily spent in discovering the best machines by which to excavate the sand of the desert into a channel for the waters of the two seas. The thousands of workmen in those early days of the canal depended on the precarious supply of water brought on camels from the Nile, and on biscuit, of which there was never more than a three days' ration on the spot. I was assured those were times of intense anxiety for the apostles of civilization in the desert. It was essential, therefore, to have an abundant supply of fresh water at all points of the works, both for the men and the machines. The first years were occupied in making the necessary trials of machines, and in taking the water of the Nile in the Fresh-Water Canal to Ishmailia and to Suez, and by pipes to Port Said. Thus at first the Maritime Canal made slow progress, and this we heard in England. But of late years the experienced contractors, Messrs. Borell and Lavalley have been induced to undertake the management, and the work has made giant progress. Machines, after several failures, have been invented to do the work required, and it is confidently expected the Maritime Canal along its whole length will be opened in October of this year. Who can tell that we in England may not be frightened out of our senses by hearing that the French Emperor has started for Egypt to perform this unimportant ceremony?

"At the Suez end of the canal everything seemed activity. I saw four large floating steam dredges at work, clearing a channel through the shallows of the Red Sea, and others being put together. I saw the Arabs busy on the other side of an embankment which divided the sea from the sea works, furrowing out the course of the canal. I had seen this part three months before, and the progress had been considerable. I saw the course of the canal beyond this marked by the enormous dredges standing above the mirage and the desert. There are sixty large and twelve small steam floating dredges, with more than a hundred attendant steam barges in work. The larger ones cost from fifteen thousand to twenty thousand pounds, which may give you some idea of their size. They discharge their buckets of sand into the steam barges or into iron aqueducts two hundred and twenty feet in length, which pass their contents over the banks of the canal on to the desert beyond. Forty-eight millions of cubic feet were thus displaced last month, and sixty million, it is thought, will be done per month in the summer days. The last mentioned machines are an invention peculiar to these works, and are due to M. Lavalley, who may be called the maker, as M. Lesseps is the originator, of the Suez Canal. The great difficulty has been found after the water rises before the dredges can be floated.

"As the Salt-Water Canal is not filled between Suez and Ishmailia,

passengers and cargo are forwarded thence on the Fresh-Water Canal in steam launches and barges. This canal is of ordinary size, and will allow two large barges to pass each other, but I wish to speak only of the great Salt-Water Canal. The first point of interest after leaving Suez is at Great Shaloof. This is the most important cutting next to El Guisr. It is four miles in length, through clay, stone, and sand, and is dry at present. Three thousand European and Arab workmen are kept here. I was more struck here than anywhere else on the works. The canal is cut to its extreme depth, and the water will stand twenty-six feet deep at low water in the Red Sea. You look down into this enormous dry channel, with its busy hive of workmen scooping away the ground and filling the trucks, which stationary engines draw up and replace by others; and while looking down on this magnificent work you almost persuade yourself to believe in large steamers passing to and fro here between the West and East, in the coffers of the company being filled with their dues, and in delighted shareholders drawing large dividends.

"At the Serapeum, some distance further inland, you come on another piece of the canal finished, and it is here you meet the waters of the Mediterranean, which have been brought over half the whole distance in the Maritime Canal and are kept back from the other portion of the works by an embankment of earth. From the Serapium you pass to Ishmailia, the capital of the company, standing on the pretty salt-water lake, Timsale, which has been filled from the Mediterranean to the depth of twenty feet. Here are the homes of the company's officers. Church, gardens, streets, even the dogs, are European, and you forget that the Arab rules the land. I was there the last days of the Carnival. Masqueraders promenaded the streets, and a ball was to be given at the Assembly-room. If financial ruin is imminent, it sits lightly on the good people of the Isthmus.

"Ishmailia, the old Arab name of which is Timsah, has been renamed after the present Viceroy, as Port Said was after the last. They might more properly have called it after M. Lesseps and M. Lavalley, but the Frenchman knows well 'how to brush the coat of the Turk the right way.' The town does not stand on the Maritime Canal, but is connected with it by a branch. You pass now to Port Said on the Maritime Canal. Its width is three hundred feet, which is reduced for economy to one hundred and eighty feet, through the cutting of El Guisr, a short distance from Ishmailia. At El Guisr you are half-way, and the course of the canal passes into a deep cutting made through a high ridge of sand. Here was the severest work.

"El Guisr is a pretty cantonment, with its Christian church and Arab mosque, its neat houses, and the pretty garden of M. Goija, the chief engineer. Here, as at Ishmailia, you are told how few years it has been reclaimed 'from the scorpion and serpent of the desert.' After leaving El Guisr the canal passes through a flat plain of sand till it enters the lagoons near the sea. A branch of the Nile flowed here in ancient times; the ground is Nile deposit, and was formerly productive. It is now desert, but, as the Arab says, 'Where the Turk

places his foot the grass ceases to grow.' It was supposed from the loose nature of the ground here that difficulty might be found in forming the channel, but M. Lavalley has excavated it to the full depth of twenty-six feet, and satisfactorily proved that mud and sand are the same in the Isthmus of Suez as in other parts of the earth.

"The canal now enters the Mediterranean, and forms the harbour of Port Said. Eight years since there was a narrow strip of sand between the sea and the lagoon, without a hut on it. I now saw a town of ten thousand inhabitants—a rapidly increasing Venice—and a port full of large shipping. I do not believe there is a single person on the Isthmus who is not firmly convinced that the undertaking will succeed. They see in a marvellously short space of time a population of twenty thousand Europeans alone created in the middle of the desert, and supplied with necessaries and luxuries. They see a great port spring up under their very eyes as if by magic, and the object of their great enterprise two-thirds completed, and they may be excused if they fall down and worship M. Lesseps and the company.

"I came a sceptic, and leave a true believer in the completion within a short time of the canal across the Isthmus of Suez. The kindness and courtesy we everywhere experienced were such as I shall always remember with pleasure, and I heard on every hand expressed the gratification all felt in showing English people the progress they were making.

"This account is necessarily most imperfect, but I am anxious to convey to my countrymen what I have seen done on the Isthmus, and so I take a Briton's recourse, and write to *The Times*.

"I am, yours truly,

"Port Said, Feb. 29th. "ST. ALBANS."

Some further light being thrown on the subject of transit with attendant expenses, we are induced to add them to the foregoing.

South Eastern Railway,
London Bridge Station, Feb. 3rd, 1868.

Daniel A. Lange, Esq., 21, Regent Street.—My dear Sir,—Since I had the pleasure of seeing you this morning it has occurred to me that you would kindly answer the following queries with reference to the route to the East:—1. What probable saving of time will be effected by a passenger using the Suez Canal route from England, viâ Marseilles, to Bombay, as against the overland, and what saving of money, if any? 2. What probable saving of time will be effected by using the Suez Canal route as compared with the route viâ Southampton, by sea to Bombay, and what saving of expense? If the same information could be given with regard to merchandise it would be very satisfactory. Of course I can only look upon the information as approximate, and it must apply to a time when the ship canal is fairly opened between Port Said and Suez.—I am, my dear Sir, yours faithfully,

(Signed) C. W. EBORALL,
Manager of the South Eastern Railway, London.

21, Regent Street, London, 6th Feb., 1868.

My dear Sir,—I have received your letter of the 3rd instant, requesting me to answer the following queries with reference to the route to the East, and have much pleasure in so doing. In reply to the first, viz., "What probable saving of time will be effected by a passenger using the Suez Canal route from England viâ Marseilles to Bombay, as against the overland route, and what saving of money, if any?" I beg to state that the time at present occupied in conveying passengers by the Suez Canal route is twenty-four hours from Port Said to Suez, and the first-class fare (forty-three francs), £1 14s. 5d., the distance being one hundred and seven miles, as per tariff which I handed to you. By the overland route across the desert by railway the distance is two hundred and fifty-two miles from Alexandria to Suez, and the first-class fare £4 10s. The time occupied should be twelve hours; I am not prepared to say how frequently this is exceeded, but any one acquainted with Egyptian administration is aware that much uncertainty attends the conveyance by rail across the desert. What I have thus far stated has reference to the canal transit arrangements as they now exist, and which may be regarded as provisional; but the question presents a very different aspect, assuming the Grand Maritime Canal to be fairly opened for the unbroken passage of ships from sea to sea. The distance will then be reduced to about ninety-six miles; there will be no detention at the locks near Ishmailia, and the time occupied for passengers lessened accordingly, and I am of opinion that in point of time there will be no difference between the railway and the canal, leaving thus the question of expense open, which, as I have already shown, stands in the relative proportion of £4 10s. by rail to £1 14s. 5d., equal to more than one hundred and thirty per cent. in favour of the Suez Canal route. Great as this difference is, it must be borne in mind that when large vessels can proceed right through, passengers on board those vessels will most probably not have even so much as £1 14s. 5d. to pay, as the item set down in the freight, or passage money for a voyage out or home to India, and for passing through the canal; which will be found unaccompanied by any fatigue, and far more agreeable than to be confined in an Egyptian railway carriage across the desert. I am not putting this forward solely on my own testimony, but as the unanimous opinion of travellers who have numerously availed themselves of the refreshing mode of water transit across the Suez canal, and with a view to show that as a matter of choice only, the water way will always be preferred even for passengers. With regard to your second question, "As to what probable saving of time will be effected by using the Suez Canal route as compared with the route viâ Southampton by sea to Bombay, and what saving of expense to passengers?" I beg to mention that a saving of one-half the distance in time would be effected by the Suez Canal route, which is about six thousand two hundred miles to Bombay, and about thirteen thousand miles viâ the Cape to Bombay from Southampton, made up as follows:—From Southampton to Port Said, three thousand one hundred and twenty miles; from Port Siad to Suez (when finished)

ninety-six miles; from Suez to Bombay, two thousand nine hundred and seventy-two miles. Total, six thousand one hundred and eighty-eight miles. The saving of expense for passengers would be in the same proportion as the saving of time, assuming always the class of steamers in which they take passage to be equally good in accommodation and diet in both cases. With regard to merchandise, which forms the subject of your last question, there is a margin of at least fifty per cent. in favour of the Suez Canal route as compared with the present overland route by rail. A detailed account of what constitutes this difference is set forth in my letter of the 7th of January, addressed to the editor of the *Shipping and Mercantile Gazette*, and which I append to this letter for your guidance. That letter deals fully with the subject, as far as relates to the advantages as now existing in favour of the canal compared with the overland route; but it does not comprise an answer to the saving of time and expense on "merchandise," as compared with the route viâ Southampton by the Cape to Bombay. This resumes itself into a question of freight (which, as you are aware, varies in proportion to the supply and demand for shipping), and which is charged in proportion to the distance, and consequent time occupied during the voyage. Such voyage being abbreviated by the opening of the Suez Canal to about one-half the distance to Bombay, there must be a proportionate saving in the freight, and not only on the freight, but a saving of "interest on capital" invested in the goods sent, also of "insurance," and in some cases of "depreciation" of value on goods, owing to the lengthened voyage round the Cape. The obvious saving in favour of the Suez Canal route is so apparent that I apprehend it needs no further detailed illustration to prove the fact. In conclusion, permit me to state that I shall at all times be ready to furnish you with any further information you may require on the subject.—I am, my dear Sir, very faithfully yours,

DANIEL A. LANGE,
English Representative and Director of the
Suez Canal Company.

C. W. Eborall, Esq., Manager S. E. R., London.

We read in the *Daily News* of the 11th of March last, that the works of the Suez Canal are fast approaching completion. From January 4th to February 7th, one hundred and thirty-seven merchant ships passed from Port Said to Suez. On February 6th, at Port Said there were four three-masted vessels and three smaller ships employed in landing cargoes of coal. The English government already profit by this enterprise, as men and war material are sent to Abyssinia with much greater rapidity and ease viâ Suez than by the old route. The consequence is, that there is nothing doing at Alexandria or Cairo, whereas traffic is brisk at Port Said.

From all which promises are fair for the speedy completion of the work. At the same time it would be satisfactory if Mr. Lesseps would inform us even of the *mean* amount of tonnage which the above one hundred and thirty-seven merchant ships made up, as such information would form a useful guide to the uninitiated.

Queen Adelaide Naval Fund.

To the Editor of the Nautical Magazine.

Sir,—I have but recently seen the letter, dated January 19th, 1868, from "A Member of the Ladies' Committee of the Q. A. N. F. since 1849," and which appeared in your Magazine for February last p. 106. Perhaps you will allow me to offer a few remarks in reply.

Your correspondent is not more anxious than others to do honour to the memory of the late Honorary Secretary of the Queen Adelaide Naval Fund, or to perpetuate the good deeds of its foundress; but in suggesting that to the designation of the "Queen Adelaide Pupils" at the Royal Naval Female School, the words "*on the Skyring* Foundation" should be added, it would be simply calling upon the General Committee to go beyond their powers; and inasmuch as the Fund was raised in memory of her whose name it bears, and for the objects she had so much at heart, it cannot be alienated therefrom to take the shape of a Memorial to others. Such would have all the appearance of raising money under false pretences.

In an Editorial foot note, the proposal is endorsed as "both just and proper, but must remain for future decision."

I beg to inform you, sir, that the General Committee have more than once considered this very question at the request of the lady who addresses you, and on a recent occasion on her motion, the Ladies' Committee referred it to the General Committee who came to the following decision—which, owing to the courtesy of our Honorary Secretary, I am enabled to send to you. "The Committee desire to record that it is not in their power to alter any of the General Regulations, and with due regard to the value of Mrs. Skyring's great exertions in behalf of the Fund they do not consider it desirable that any change in their style should take place, as such would be a departure from one of the original intentions of the Fund, which was to perpetuate the memory of the late Queen Dowager's deeds of Naval Charity, nor are they prepared to recommend such a proceeding to a General Meeting of the Subscribers."

If you will allow me, I would suggest to your correspondent that her object might be gained if she would undertake the initiative by raising a fund which she could designate "Skyring Foundation" or "Memorial," and graft it on to the "Queen Adelaide Naval Fund" in aid of such of its objects as she might desire to assist. Doubtless, very many of the personal friends of Mrs. Skyring and her lamented son—with others—would respond to her appeal; and I doubt not, that you would kindly allow any such appeal to make its first appearance in the pages of "*The Nautical.*"

I am, Sir,

Your most obedient servant,

A Member of Committee of the Queen Adelaide Fund.

London, April, 1868.

[We trust our correspondent will be satisfied with this decision, and that we shall hear no more of it.

The friends of the Queen Adelaide Fund will be gratified in learning that the President, the Earl of Hardwicke, has sent a donation to the Secretary of fifty pounds—we have already recorded another, and trust that the exertions of the Committee will yet be encouraged by some more of the same kind of gifts from among the friends of the subscribers, in reference to the appeal that was made to them a month or two ago in the pages of this journal. Such gifts are *very much wanted.*]

North Pacific Ocean.

The following further information concerning these islands is from a notice published by the Admiralty.

Islets and Reefs of the North Pacific.

Midway Island Group (or Brooks Islands).

(Near an island marked (?) on Admiralty Chart.)

Welles Harbour Anchorage	Lat.	28° 14′ 0″ N.	Long.	177° 23′ 15″ W.
N. Point of Sand Island ..	,,	28° 13′ 30″ N.	,,	177° 21′ 30″ W.
N. Point of Eastern (or "Middle") Island	,,	28° 13′ 30″ N.	,,	177° 18′ 20″ W.

Ocean Island Group.

(Curé Island and adjacent reef of Admiralty Chart.)

Sand Island	Lat.	28° 24′ 45″ N.	Long.	178° 27′ 45″ W.
N.W. Point of Green Island	,,	28° 24′ 50″ N.	,,	178° 26′ 5″ W.

Pearl and Hermes Reef.

(Pearl and Kerm Reef of Admiralty Chart.)

N.E. Point of Reef	Lat.	27° 56′ 30″ N.	Long.	175° 46′ 0″ W.
S.W. End of Reef	,,	27° 48′ 45″ N.	,,	176° 0′ 30″ W.
S.E. Point of Reef	,,	27° 48′ 0″ N.	,,	175° 47′ 30″ W.

Report of Captain Wm. Reynolds, U.S. Ship "Lackawanna," on Midway or Brooks Islands, Ocean Islands, and Pearl and Hermes Reefs.—30th September, 1867.

Midway Island Group.

"The reef around Brooks island is pear-shaped, with the stem to the eastward; it is 18 miles in circuit, as measured by the patent log in two runs around it, and is without a break, except on its western side. At the north-west point are a few detached rocks and breakers, from which a compact coral wall about 5 feet high, continues from 6 to 20 feet broad, and continues for 4½ miles to the southward and eastward, when it becomes a line of detached rocks, very little more than awash, for 2½ miles to the southward; where off the centre of "Middle Brooks island," the rocks

dip under water, but reappear 2 miles to the westward, and again show as a continuous wall for about 4½ miles to the northward and westward, where it ends and forms the south side of the entrance to "Welles harbour."

This entrance is about three-quarters of a mile wide. From its northern edge to the north-west rocks is a bed of coral with one to 16 fathoms, showing above water in one place, with occasional breakers.

The reef is steep on its northern, eastern, and southern sides. The bottom is visible in two places only where the soundings are shown on the chart.

On the west side there is sheltered anchorage from the trade wind in from 10 to 13 fathoms, foul bottom. The best outside berth is in "Seward roads," in 10 to 13 fathoms water.

At the eastern end of the roof, or in the stem of the pear, is "Middle Brooks Island," also pear-shaped, one and a quarter miles in length and half a mile wide, from 16 to 15 feet high, covered with a growth of small shrubs, coarse grass, and some vines. The soil is coral, sand, and shells, of a dazzling whiteness.

By digging 4 to 7 feet, water is found that one may drink when its contents are subsided by standing a short time.

A mile and a quarter west of Middle Brooks island is Lower Brooks island, a sand heap of irregular shape, one and a half miles long, three quarters of a mile broad, and 57 feet high at the highest part, on which is a flag-staff.

Vegetation has commenced on this island, clumps of shrubs are seen on portions of its edge, and some grass, most of which is on its south-west end. The glare from the white sand distresses the eye.

Captain Burdett has seen 250 yards of it washed away, and again reform during the few weeks he was ashore. The sand spit up by the north-west rocks, which was quite conspicuous on the 16th, had almost disappeared by the 27th, and from the quantity of sand thereabouts, a permanent sand island appears to be forming.

On the lower island the agent of the Pacific Mail Company has established himself, because it borders on the harbour.

"Welles harbour" is very much like that of Honolulu, rather more roomy and as safe, but has not quite the same depth of water on its bar, having but from 21 to 16 feet at low water.

This bar is narrow, formed of coral rock with small sand holes; its depth varies from 21 to 16 feet, constantly changing from 3½ to 3 fathoms, so as to make it unsafe to cross, unless a three-fathom cast or two is obtained. The *Lackawanna* had 19 feet going in, and two casts of 18 feet in going out, all at low water.

Like Honolulu, the entrance to Welles harbour is from the west, through an opening in the coral reef, not less than 800 feet across. It can be entered as readily as Honolulu at all seasons of the year. Depth of water for anchoring 5 to 7 fathoms, white sandy bottom.

This harbour is cut off from the lagoon by a mile of shoal water; and

our survey, carefully made, does not disclose a passage anywhere by which ships may enter it.

It would be possible for a light-draught vessel to get into the lagoon by passing to the northward of the "middle ground," and threading her way in among the rocks, but no channel proper for ships exists.

The lagoon is two miles in length, and one and a half miles in its greatest breadth. There are many coral heads in it of one or two fathoms water; otherwise the soundings are regular over white sand.

"Welles harbour" will, therefore, be the resort for ships drawing not more than 18 feet. Larger vessels must use "Seward roads," picking out a sandy bottom for their anchors.

The greatest rise and fall of the tide, observed during neaps was 18 inches; the least 15 inches. Ebb runs 6½ hours, flood 5½ hours. From the appearance of the beach the rise of the spring tides seems to be as much as 3 feet, these allowing a greater draught to be carried over the bar. The bar is well within the entrance, and there is no swell on it during the trade winds.

Captain Burdett, agent of the Pacific Mail Company, was recommended to set up a tide staff, and pay particular attention to the rise of the spring tides.

At our outside anchorage the direction and strength of the current was taken every half hour. The flood sets to the northward, the ebb to the southward, greatest rate one knot. At "Welles harbour," the current of ebb was *always* to the westward, very weak.

The coral shelf extending from the north-west end of the reef to the southern wall is most irregular, having not only deep fissures in the rocks, but sandy spaces, among the former of which we lost an anchor.

On making two circuits of the reef, no off-lying dangers were found. "Pearl and Hermes reef" to the eastward, and "Ocean island" to the west, being the only dangers in the way of direct approach.

During our stay of 17 days we had mostly fine clear weather, with light winds from N.N.E. to S.S.E. On the 28th August, it blew hard from South and S. by W. for some hours, with rain. Rain fell on six days, mostly, however, between sunset and sunrise, and but seldom accompanied with wind. Captain Burdett informed me that during his stay of four weeks before our arrival strong trades had prevailed with clear weather. On the day we left the wind came out S.W. by W.

Steamers, in approaching Brooks island from the eastward, should make "Middle Brooks island," and follow the southern wall to the entrance of the harbour. If coming from the west, the "Lower island" should be made. Sailing vessels from the eastward, during the trade season, should keep to the northward of the reef, and pass around the N.W. rocks so as to have a fair wind for "Seward roads." Square-rigged vessels must warp into the harbour with easterly winds.

On the N.E. beach of "Middle Brooks island" a broken lower mast of a ship is lying, the step and head wanting; it is 2½ feet in diameter, and had been fished and strengthened with iron bands. On the east beach and

on the bluff, occasional drift timber is to be met with, and some lumber, mostly spruce and redwood. On the west side, or lagoon beach, is a portion of the trunk of a redwood tree five feet in diameter, and also the skeleton of a calf sperm whale.

On the lagoon side of the other island, two lower masts of junks are stranded, and several redwood logs elsewhere; one of these over two feet in diameter.

Tropic birds, men-of-war hawks, and gulls, swarm on these islands. A few curlew and plover are the only land birds met with. Turtle abound, but seals were seen only occasionally. Fish of many varieties in great abundance; we hauled the seine frequently, catching enough for all hands; among them many very fine mullet."

Ocean Island.

"Ocean island is almost the facsimile of Brooks island. It commences also with a coral wall at its N.W. extreme, that continues without a break until it dips under water about the centre of Green island, and entirely disappears. From the end of the wall, the breakers continue to their termination about a mile west of the N.W. end of the Sand island; from thence to the N.W. rocks the water is shoal, denying all entrance to the lagoon, which is all shallow water.

Green island is similar in appearance from the sea to Middle Brooks island, but portions of the shrubbery are higher. There is a small sand spit between it and the Sand island, as at Brooks island; but the Sand island here is not more than 10 feet above the level of the sea. The trunk of a large tree was lying high and dry on the S.E. side of this Sand island, and on the N.E. end of the Green island we saw a ship's lower mast, recently landed.

This reef is 14¾ miles in circumference; no outlying dangers were seen from our masthead, nor any other land."

Pearl and Hermes Reef.

"Pearl and Hermes reef, like Ocean and Brooks islands, has a coral wall above water at its N.W. extreme. It has, however, the appearance of detached rocks than a continuous parapet, and is soon lost to view beneath the surface, still our examination was not very close for want of time.

The N.E. corner includes a sand island. Another showed itself some miles to the westward in the lagoon. Three others lie along the southern edge of the reef, which turning to the northward and westward, close to the westernmost island, soon after ceased to show any signs of breakers. Shoal water, however, makes out for some miles to the west, and then trends in north-easterly towards the N.W. rocks. In this the western side of the reef resembles French Frigate shoals.

We made the circumference of the reef to be 42 miles. Its shape is irregular, its diameter from N. to S. 9½ miles, from east to west 16 miles."

Report from Mr. S. D. Kennedy, Surgeon, U.S. Ship "Lackawanna," on the Soil, Natural Features, etc., of the Midway Island Group.

MIDWAY ISLAND GROUP.

"I have made an examination of the soil, growth, and water upon Brooks Island, and have to report as follows:

These are two long low islands chiefly formed of coral shells and sand. They lie in a lagoon surrounded by a barrier reef, except at one point, where a breach in its continuity affords an entrance of three fathoms in depth.

The North island is one mile in length and half a mile in width; while South island is somewhat larger and higher, but has less soil and scantier vegetation. A beach consisting of white sand, disintegrated shells and coral, extends from the lagoon to a distance of from fifty to one hundred yards all around the North island. Inside of this space, the island gradually sloping from its two highest points (the north eastern 15 feet, and north-western 8 feet), is covered with a growth of coarse grass and low shrubs. From its north-eastern point, a ledge of coral rock, lying at an angle of five degrees, extends about one hundred yards into the lagoon. From this point, a fringing reef of the same kind of rock, at about the same declination, runs for two-thirds of the extent of the eastern side of the island.

Judging from this peculiarity of coral formation, and the numbers of dead shells, corals, and mollusks found on the highest points, this portion of the island seems to be emerging.

Over all that part of the island where vegetation is found, there is a superficial layer of fine, porous, grayish sand; but generally it is devoid of vegetable mould; beneath, you come at once to coarse sand and gravel.

On the south side of the island there is a slight depress' n, embracing about five acres, extending from N.N.E. to S.S.W. This area has a superficial stratum of vegetable mould from eighteen inches to two feet in depth, mixed with a small per-centage of guano; beneath this is a layer of coarse sand of the depth of one foot, and below this another stratum of loose stone, shells, and corals, closely packed together, extending down to the hard coral. This foundation of the island, as of the reef, consists of madrepore, meandrina, and porites coral. But little of the red coral can be found about the island or in the lagoon. This embraces the whole extent of anything like true soil that I was able to find on the island. This mould is, I think, of sufficient richness to raise potatoes, peas, beans, and other vegetables adapted to light soils. There is a small amount of guano mixed with it; and with cultivation it would doubtless become richer by the addition of decomposed vegetable matter.

The vegetation of the island consists entirely of shrubs, herbs, and coarse grasses; none of the shrubs are over three to five feet high. Of these, and the herbs, the principal families are the leguminosæ, lobeliacæ, portulacea, and convolvulacea. Some seem to be new species of the different genera of the above families.

On both islands several wells have been dug and water found at depths of from four to seven feet. I have tested the water taken from these as far as the materials which I have will admit. When first collected, the specimens were so full of sand and organic impurities in a state of suspension, that it was necessary to filter them. After filtration, tested by different re-agents, they were found to be hard, free from organic impurities in solution, to contain carbonic acid, carbonate of lime, and a per-centage of chlorides. The quantitive analysis of these constituents I have been unable to make for want of proper materials, but have preserved specimens for further experiments. It becomes better adapted to drinking after standing some time. Captain Burdett, of the Pacific Naval Steamship Company, is reported to have found fresh water; but so far, he has chiefly used it for washing, and the specimen sent off to me gave the same results, when tested, as the others. The water seems to become purer in proportion to the depth; and there is every evidence that wells, properly sunk to a good depth, would afford a good supply of potable water.

Immense numbers of sea birds are constantly hovering over and alighting upon these islands. The bushes and surface of the ground are thickly covered with their nests; while the young birds, unable to fly, are so numerous as to make it difficult to walk any distance without trampling upon them. The principal varieties are gulls, fern, gannet, men-of-war, and tropic birds. From such vast numbers there should be a large amount of guano deposited; but, except in the five acres I have spoken of, its accumulation is small, owing to the looseness or porousness of the soil allowing it to be washed away or filtered through it.

The lagoon is full of fish, seal, and turtle. The seal is the phoca vitulina, or common hair seal, and is not of much commercial importance. The fish belong principally to the mullet, perch, and mackerel families; many of them are of most brilliant colours, and seem to be species of the genus coryphena (dolphins). Large quantities of the holathmian, beche de mer, exist on the bottom of the sea, both inside and outside the reef, and can be gathered without any difficulty.

During the seventeen days that this vessel remained at the islands, the lowest point which the thermometer reached was 72°, while the highest was 89°. The barometer varied from 29·22 to 30·25.

There appears to be enough true soil, of sufficient depth to raise a good many vegetables upon it at present, and with but little trouble the extent of this area might be increased.

The water in some of the wells now dug might be used in an emergency, and doubtless by sinking properly constructed wells to a sufficient depth, perfectly potable water may be found. Owing to the nature of the soil, these may be made with but little labour and at a very small expense."

Hydrographic Office, Admiralty,
23rd March, 1868.

Middlebrook Island as a Coaling Station for North Pacific Steamers.

The United States Steamer *Lackawanna*, which left Honolulu on the 30th of July to survey Middlebrook Island and Reef, in North Lat. 28° 16′, and West Long. 177° 12′, returned there on the morning of the 2nd of October last, after a long passage of thirty-two days from the island. Middlebrook Island lies about twelve hundred miles from Honolulu, and the passage thither was made in fourteen days. On the arrival of the ship, the schooner *Milton Badger*, which had been dispatched thither by the Pacific Mail Company (who design making it a coal station, to be used in case of their steamers being disabled,) was found at anchor in the harbour. Capt. Burdett had erected two frame houses, for which he had taken with him ample materials in the schooner. During the stay of the *Lackawanna* in the lagoon, a thorough survey was made of the harbour and channels. A maximum depth of nineteen feet of water was found in the entrance, which is very narrow. The tide rises and falls two feet at that port. The lagoon, though deep, is said to be rendered unsafe on account of the numerous sunken coral rocks and fissures in it; but these might doubtless be buoyed at some expense. It seems that the result of the survey is not very favourable to the selection of this island for a coaling depot, or even a port of refuge. It may perhaps be used as such, but the light draft of water in the channel, the sunken rocks in the harbour itself, and the difficulty in making out the island in stormy weather, are all against its selection as a port. A lighthouse can be built, which will serve to guide vessels, but its maintenance will be expensive. So too, wharves may be built, but these must necessarily be expensive. Plenty of fish and turtle abound there, and on one of the islands pretty good drinking water has been found by digging. Capt. Burdett, with a gang of men, remains on the island, and they occupy the houses erected, while the schooner was dispatched to San Francisco direct in charge of the mate, with the official report of the *Lackawanna*. Some think favourably of the selection of Middlebrook Island as a depot for the China steamers; but one or two trials of these large vessels will satisfy their masters that some more civilized port had better be fixed on, if it is designed to have a regular coaling station. One fact which insurance companies ought to know is that the *Lackawanna* lost two anchors at the island, and the *Milton Badger* another. And these were lost in the very place where large vessels can only anchor. From this anchorage to the coal depot is three miles, which distance every ton of coal put on board must be lightered.

The return trip of the *Lackawanna* to Honolulu occupied thirty-two days, she having sailed about three thousand five hundred miles, though the island is only one thousand two hundred miles from Honolulu.

Although it does not seem likely that this island will be adopted as a coaling station, we preserve the information of the position of it and its character.

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 225.)

Name.	Place.	Position.	F. or Fl.	Ht. in Ft.	Dist seen Mls	Remarks, Bearings are by Compass.
28. Santa Martha	Cascaes	Portugal	...	52	5	Established 1st March, 1868. A Red Light. See Notice No 28
29. Palma Mole	Majorca	Balearic I.	F.	35	2	From March, 1868. Red Light. Entering the Mole keep the light half a cable on Starboard hand.
Tripoli	Syria	... ...	F.	...	...	Former Light changed to fixed *Red*.
30. Manfredonia	Italy, East Coast.	Mole	F.fl.	95	13	Established 18th March, 1868. One Hundred and Sixty yards from end. Flash once a minute.
31. Odessa	Richelieuski	Mole	F.	31	6	Established, not said.
Kertch Strait	Cape Takli	Beacon	...	90	...	With a Black Triangle and Red Barrel.
Bell Buoy	placed on	Kos Aoul-skaia	...	...	...	Bank S. by W. ¾ W., Two miles from above beacon.
32. Bosphorus	Entrance	from the	...	...	...	Black Sea. See Notice No. 32.
33. About Ports-mouth	... ...	... ...	...	...	...	Alteration of Buoys. See Notice No. 33.
34. Deal Bank Buoy	... ...	... ...	...	...	...	Alteration in position. See Notice No. 34.
35. Crooked I. Passage S.E. Entrance	Castle I.	22° 6'·7 N. 74° 20'·7 W.	F.	123	17	Established 1st June, 1868, or about.
36. Bosphorus Light Vessel	15' N.N.E. of the Entrance.	... ...	...	...	...	August, 1868, to be in her position. See Notice No. 36, for Rocket and Life-Boat Stations.
37. Swashway Marks	Portsmouth Entrance	... ...	...	...	...	See Notice No. 37.

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

No. 28.—*Directions.*—By keeping the red light by night, or the light tower by day, in line with the Guia lighthouse, vessels may freely pass the north channel of the Tagus (known as the Corridor) in from 6 to 10 fathoms, sand.

Vessels bound for the River Tagus coming from the north and passing Cape Roca, when nearing Guia light, must keep off the coast sufficiently to open out Cascaes light, thus avoiding the rocks of Pombeira, Nau, and Ponta da Insua. Those intending to anchor opposite Cascaes may do so with Cascaes and Guia lighthouses in one, in from 7 to 10 fathoms water, sandy bottom.

No. 32.—BLACK SEA.—*Beacons, Rocket Stations, and Refuge Houses near the Entrance of the Bosphorus.*—The Imperial Ottoman Government has given Notice, that, in order to render the coasts on either side of the entrance of the Bosphorus more readily distinguished in thick weather, it will, as soon as possible, place Beacons at different positions between Kili lighthouse on the Asiatic shore and Chesmedjik (two leagues west of Karobournou lighthouse) on the European shore; also that Rocket stations and Refuge houses will be established near them.

Eight Beacons will be placed on the European side and eight Beacons on the Asiatic side.

The description and position of the Beacons are as follows, viz. :—

European Side.

To be surmounted by a *Cone*, and painted *red and white* in horizontal bands.

The colour of the Karabournou lighthouse will be changed to resemble that of the Beacons, viz., *red and white* in horizontal bands.

	Ht. Ft.	Beacon.	Position.
1	50	A single truncated cone	Bouzoun Point, 2 mls. from Roumili Lt. He. *Rocket station —Refuge house to the eastward.*
2	50	A truncated cone surmounted by a triangle	Kilios, 3½ miles from Lt. He.
3	48	A truncated cone surmounted by a triangle vertex downwards	Hissar Kaiasy, 6 mls. from Roumili Lt. He. *Rocket station*
4	40	A large triangle surmounted by a smaller	Agali, 10¾ miles from Roumili Lt. He. *Refuge house and Rocket station.*
5	40	A triangle with a smaller triangle over it—vertices joined	Ak Bounar, 14 miles from Roumili Lt. He.
6	45	A low cone surmounted by two triangles, vertices upwards	Koudouz, 17 miles from Roumili Lt He. *Refuge house.*
7	45	A triangle surmounted by two smaller, the highest with vertex inverted	Derkos, 23½ mls. from Roumili Lt. He., and 3 miles west of Karabournou Lt. He. *Refuge house to the eastward.*
8	45	A triangle surmounted by a board over which is an inverted triangle	Chesmedjik, 26¼ mls from Roumili Lt. He., and 5¾ miles west of Karabournou lighthouse.

Asiatic Side.

To be surmounted by a *Ball*, and painted *light red* (similar in colour to Kili lighthouse).

	Ht. Ft.	Beacon.	Position.
1	30	A triangle surmounted by a globe on a staff	Cape Anatoli, ⅝ mile N.E. from Lt. He.
2	30	A larger triangle surmounted by a larger globe on a staff	Yoni-bourn, 1¾ miles from Anatoli Lt. He. *Refuge house.*
3	50	A triangle surmounted by two globes, the latter on a staff	Elmas Tabya Island, 3 miles from Anatoli Lt. He. *Rocket station.*
4	40	A triangle surmounted by a lozenge: this last surmounted by a globe: no staff	Kelagra Bouraun, 4½ miles from Anatoli Lt. He. *Refuge house.*
5	50	The same of lesser dimensions with a staff	Adadjiklar, 6½ miles from Anatoli Lt. He. *Rocket station*
6	41	A triangle with globe resting on its apex	Karabournou, 10 mls. from Anatoli Lt. He. *Rocket station*
7	40	A triangle with two globes resting on its apex one above the other	Aladjali, 13 mls. from Anatoli Lt. He.
8	40	A triangle with a staff from its vertex, bearing a hemisphere or half globe with a globe over it	Magra Bournou, 17 miles from Anatoli Lt. He., and 5 mls. west of Kili Lt. He. *Refuge house and Rocket station.* *Refuge house midway between No. 8 beacon and Kili lighthouse.*

Thus it will be seen that only triangles surmounted by globes and lozenges will be seen on the Asiatic side of the Bosphorus entrance, while cones and triangles (but no globes) will be seen on the European side. See further notice about the Light Vessel.

The cones and globes on the beacons are constructed of a light iron frame, covered with basket-work.

The lower part of each beacon is of an octagonal form, boarded over.

NOTE.—*The erection of these beacons commenced in December*, 1867, *nine were completed early in March, and it is probable the whole will be completed in May*, 1868.

No. 33.—The following is the substance of a notice, dated April 9th, issued by the Admiralty.

Intended alteration of Buoys at the approaches to Portsmouth Harbour, including the Owers.—The buoyage of the Solent having been transferred from the Admiralty to the Trinity Board, it has been considered advisable that the whole of the buoyage of these waters should be remodelled on the system adopted since 1860 by the Trinity Board, with the approval of the Board of Trade, and concurred in by the Admiralty.

The Starboard side of channels entering will be marked by black or red buoys only, and the Port side by black or red buoys chequered, or striped vertically with white. Middle grounds will be marked by black or red buoys with white bands or horizontal stripes. Only one colour, either black or red, will be used in the same channel.

When *beacons* are considered necessary to be placed on buoys, the Starboard side, entering, will be distinguished by *globes;* the Port side, entering, by *cages;* and Middle grounds by *triangles* or *diamonds.*

The contemplated changes will be effected on or about the 1st day of October, 1868.

WESTERN ENTRANCE TO SPITHEAD—*By Needles Channel and Solent.*

Buoys as at present.	Names of Shoals.	Buoys as they are to be.	Buoys as at present	Names of Shoals.	Buoys as they are to be.
Red	Shingles S.W.	Red and White Chequered.	White	Prince Consort	Red.
Black and White Striped	Elbow ...	Red and White Striped vertically	Black	Calshot Spit	Red and White Chequered.
Red and White Chequered	Shingles N.E.	Red and White bands.	White	Old Castle	Red.
Black	Warden Ledge	Red.	Black and White Chequered	N.E. Bramble	Red: to be called Hill Head
White	Black Rock	Red.	White	E. Bramble	Red and White Striped vertically.*
Red	Lymington Spit	Red and White Chequered.	Black	West Middle	Red and White bands (can).
White	Hampstead Ledge	Red.	Black	East Middle	Red and White bands (conical).
White	Salt Mead	Red.	White	Peel Bank	Red.
Black	Lepe Middle	Red and White Striped vertically	White	West Sturbridge	Black and White bands (can).
White	Gurnet Ledge	Red.	White	East Sturbridge	Black and White bands (conical).
Black and White Chequered	Thorn Knoll	Red and White bands.	Red and White Chequered	Sand Head	Black and White Chequered.
Red	West Bramble	Red and White Chequered with a cage.			

* To be moved S.E. by E. 9 cables from present position.

EASTERN ENTRANCE TO SPITHEAD.

Western Side.			*Eastern Side.*		
Buoys as at present.	Names of Shoal.	Buoys as they are to be.	Buoys as at present.	Names of Shoals.	Buoys as they are to be.
Black	S.E. Princess a	Black and White Chequered with cage. To be moved S.E. 4 cables from present position.	Red and White bands	Shelly Buoy	Black conical.
			Black and Globe	Eastborough Head	Black and White Chequered with cage.
White	N.W. Princess a	Black and White Striped vertically	Black and White Striped	Owers Middle	Black and White Chequered.
Black	Bembridge	Black and White Chequered.	Red	Pullar ...	Black and White Striped vertical.
Red	Nab Rock	Black and White bands.	Black and White Chequered	Street ...	Black conical.
White	No Mans Land	To be removed.	Red	Bullock Patch	Black.
			Black	Horse ...	To be removed.

Entrance to Portsmouth Harbour.—The Boyne wreck buoy will be altered from White to Green (can). Outer Spit buoy as at present Black, White, and Chequered.

The buoys marking the port side of the channel in entering will be Chequered Black and White; and those marking the starboard side will be Black.

No. 34.—ENGLAND—EAST COAST, DOWNS.—*Alteration in position of Deal Bank Buoy.*—In consequence of the Deal Bank having increased in height, it has been found necessary to alter the position of the Deal Bank Buoy, which has accordingly been moved into the following position, viz.:—

South end of Deal Hospital on with Upper Deal Mill, W. by S.

Upper Deal Church just open to the southward of the Time Ball Tower, W. $\frac{1}{4}$ N.

Woodnesborough Church just open of the north end of Deal Terrace, N.W. northerly.

Bunt Head Buoy, E. by S. $\frac{1}{2}$ S., southerly $1\frac{4}{10}$ miles.

South Brake Buoy, N.E. $\frac{3}{4}$ E., $1\frac{1}{2}$ miles.

South Fairway Buoy, N. by E. $\frac{1}{4}$ E., $2\frac{7}{10}$ miles.

The Buoy now lies in 24 feet at low-water spring tides.

All bearings are Magnetic. Variation 19° 50′ *Westerly in* 1868.

No. 36.—*Rocket and Life-boat Stations and Refuge Houses near the Entrance of the Bosphorus.*—The following Rocket and Life-boat stations and Refuge Houses will be established in connection with the beacons as described in Notice to Mariners No. 32, dated 10th April, 1868.

	European Side.		*Asiatic Side.*
1	Refuge house between Roumili lighthouse and No. 1 beacon, $\frac{3}{4}$ of a mile from the lighthouse.	1	Refuge house at No. 2 beacon.
2	Rocket station at No. 1 beacon, Bouzoun point.	2	Rocket station at No. 3 beacon.
3	Rocket station at No. 3 beacon, Hissar Kaiasy.	3	Refuge house at No. 4 beacon.
4	Refuge house and Rocket station at No. 4 beacon, Agali.	4	Rocket station at No. 6 beacon, Karabournou.
5	Refuge house at No. 6 beacon, Koudouz.	5	Rocket station and Refuge house at No. 8 beacon, Magra bournou.
6	Rocket and Life-boat station at Karabournou lighthouse.	6	Refuge house midway between No. 8 beacon and Kili lighthouse.
7	Refuge house 2 miles east of Karabournou lighthouse.	7	Rocket and Life-boat station at Kili lighthouse.

Articles necessary for the succour of shipwrecked people will be kept in the Refuge houses.

No. 37.—*Alteration in the Swashway Beacons, Portsmouth.*—The outer or red Swashway beacon on Southsea beach has been moved about 16 yards W.N.W. of its former position, and is now used (instead of the Coast Guard flagstaff, which has been removed) as a leading mark in from the Spit buoy to the bar leading mark, by keeping it in a line with Fitzclarence monument bearing N. ¾ E.

The upper part of the inner or black Swashway beacon also on Southsea common has been painted with a vertical white stripe down the centre. The two beacons in line bearing about E. by N. ½ N. lead over the Swashway as before.

All Bearings are Magnetic. Variation 21° *Westerly in* 1868.

CLEARING THE DISTANCE.

A New Method.—Should the earlier part of the calculation in the page 40 of this Magazine (for January) be thought too lengthy, the following part may perhaps be shorter, thus :—

Sun's app. alt.	47°	32′	sec.		0·1706
Moon's app. alt.	36	52	sec. 0·0969		
App. Distance..	48	20	cosec. 0·1267	..	0·1267
	132	44			
½ sum	66	22	cosin. 9·6030		
1st rem.	18	50	sin. 9·5090	.·.	9·5090
2nd rem.	18	2	cosin. ..	..	9·9781

Moon's angle 55° 28′ .. { haversin 9·3356 } { 9·7844 = 102° 33′½ } Sun's angle, sec. 0·663
{ sec. 2465 }

Moon's corr. of alt.		45′	35″	prop. log. 5965		Sun's corr. of alt. 47′ p. log..	2·361
Moon's corr. of dist.		25′	50″				
App. distance ..	48°	20	0		8430		
	47	54	10			Sun's corr. of dist. + 10″½ =	3·024
				Moon's corr. of alt. ..		46′ = 16″	
Sun's corr. of dist.		+ 10½		Moon's corr. of dist..		26′ = 6	
Moon's 2nd corr. of dist.		+ 10		.. ..			10″
True distance ..	47°	54′	30″½				

In this example, the Sun's corr. of alt. is so small, it is not worth the trouble of correcting the angle at the moon (only + 1′).

Notes.—Set down in order the sun's alt., the moon's alt., and the app. distance. From the half sum subtract the sun's alt., and the app. dist., and call the remainders 1st and 2nd rem. respectively. The sums of the

two columns of logarithms are the log. haversines (or sine squares) of the angles at the objects, and proceed to the end according to the rule given in page 40 of this Magazine.*

Or :—"Subtract the sum of each column of logarithms (as above) from the sum of the constant 9·6990, and the prop. log. of the correction of alt., and the remainders are the prop. logs. of arcs A and B; these arcs are always *additive*, and the corrections of alts. *subtractive*."

Moon's corr. of alt. prop. log.	0·5965	Sun's corr. of alt.	2·361
Constant	9·6990		9·699
	0·2955		2·060
First sum from above =	9·3356	Second sum	9·784
Arc A = + 19′ 45″ =	0·9599	Arc B + 57″	2·276

Arc B	+	57	
App. dist.	48°	20′	0
	48°	40′	42″
Moon's corr. of alt.		45	35
Sun's corr. of alt.		0	47
Moon's 2nd corr. of dist.			+ 10
True dist... ..	47°	54′	30″

But in this last rule, the sun's altitude, when small, is to be avoided, on account of the largeness of the correction of alt.

If the computer has no table similar to Raper's 56, or Norie's XXXV., let him use the small Table II. in page 83 of this Magazine.

E. H. HEBDEN, JUN.

Scarborough, MARCH 20th, 1868.

* If the computer has no Table of log. haversines or line-squares, let him divide the two sums of the columns by 2, and the quotients are the log.-sines of half the angles at the objects.

ON DEPOLARIZING OR DEMAGNETIZING SHIPS.

IN our volume for 1866, appeared some highly interesting remarks on the subject of the behaviour of the compass in iron ships. And a paper read by Mr. Evan Hopkins, C.E., before the United Service Institution (with the discussion thereon) forms a prominent feature of that subject; and one following it, no less important (although more brief) contains the remarks of Staff-Commander Evans, R.N., whose especial duty is the whole charge of magnetism as far as concerns its use in the ships of H.M. Navy.

Commander Evans shews that the pretensions to the "depolarization of iron ships" by Mr. Hopkins, or that the "polarity acquired by an iron ship in building can be destroyed before leaving the dock" were simply *chimerical*, and that the *Northumberland* "had in no sense of the word been depolarized." So that the assertion contained in the Athenæum, as alluded to in Mr. Hopkins' paper, was erroneous.

Such observations were made by Commander Evans as set the whole question of depolarizing an iron ship entirely at rest in the

minds of discreet men. Indeed, when one considers that every ship (and more especially an iron ship) is after all a huge magnet, the idea of depolarizing her to "prevent the deviation of the compass" seems absurd. The actual direction of the joint effect of the whole may no doubt be changed, but the magnetism still remains, altered in direction perhaps, but never destroyed. However, the *Northumberland*, on which ship Mr. Hopkins had operated, and after him Commander Evans, has been again the subject of experiment, and another interesting paper was read by Commander Evans on these experiments in March last before the Royal Society, of which the following is an abstract.

The *Northumberland* is a ship of 6621 tons, built at Millwall, River Thames; head N. 39½° E. magnetic, and completed with the armour-plates in the same direction: the launch was effected on 17th April, 1866; the ship then lay for eight months in the Victoria Docks, head S. 22° W. magnetic, or in a direction nearly opposite to that occupied in building.

From January to March, 1867, the ship lay at Sheerness swinging to wind and tide: then removed to Devonport and placed in dry dock, head S. 84° E. magnetic, remaining there till the present time. Observations of deviation and horizontal and vertical force were made at the standard compass (elevated 8¾ feet from the iron deck, and 172 feet distant from the stern), the poop-, and two steering-compasses (starboard and port), the latter being on the quarter deck below the poop-compass,—the group being placed near the steering wheel, fifty-two feet from the stern, and each compass four feet above its own deck.

The polar force at each compass was originally directed to the part of the ship which was south in building; it diminished in the Victoria Docks, showed a tendency to return to its original amount at Sheerness; and finally a large tendency to starboard was developed by the position of the ship in dock for the lengthened period at Devonport.

The results of tables constructed on these several occasions show that the greater part of the polar magnetism was caused by the sub-permanent magnetism of the *whole mass of the ship*, due to her position in building and afterwards: this polar force was so great as to require correction by magnets in addition to the usual tabular corrections.

The *Northumberland* having been the subject of a singular attempt to "depolarize" her, by the Patentee of a process "for an improved method of correcting the deviation of compasses in iron ships,"* it may be well to observe that the attempt was made—first

* See also a full account of this "depolarizing" process, with the general views of the patentee, it will be found embodied in two papers read before the Royal United Service Institution, and the discussions thereon, as published in the Journal of the Institution:—the first paper, on "Terrestrial Magnetism with reference to the Compasses of Iron Ships; their deviation and remedies," read January 29th, 1866; the second paper, on "The Demagnetization of Iron Ships, and of the iron beams, etc., of wooden vessels, to prevent the deviation of the compasses, etc.," read May 6th, 1867,—both papers by Evan Hopkins, Esq., C.E., F.G.S.

on the 4th August, 1866, in Victoria Docks, by moving electromagnets over the external plates of the ship, but without effect; next at Sheerness, in January, 1867—a similar process without effect; then by applying electromagnets to the beams of the poop-deck, in immediate proximity to the poop- and two steering-compasses, and with considerable effect, as a powerful north pole of a subpermanent quality was developed in the centre of those beams (about five feet abaft the compasses), producing a repulsive force on the poop- and steering-compasses amounting nearly to two-thirds of the earth's force.

By this the semicircular deviation of the poop and port steering-compasses was reduced to one-fourth of its original amount. But it was found to have returned in the course of a year (eleven months), as determined by observations made in June, August, and December, 1867, to three-fourths of its original amount. The deviation of the starboard steering-compass was found to have altered slightly in amount, and largely in direction. But it is now, in common with that of the two compasses just named, gradually returning to its original state.

The deviation of the standard compass was not affected by the operations in the slightest degree.

The "heeling" deviation of the poop-compass was affected in nearly the same way as its semicircular deviation. The "heeling" deviation of the starboard steering-compass was *increased;* but the *increase*, like the decrease of the poop-compass, was fast disappearing in December, 1867.

The correction by the "*depolarizing*" or "*demagnetizing*" process was therefore both *imperfect* and *transient*, and productive of more injury than benefit; in consequence of which the Lords Commissioners of the Admiralty have been recommended to forbid any means of producing the so called "depolarization," being placed within twenty feet from any compass used at any time for the navigation of the ship.

The whole subject, therefore, of *depolarizing* or *demagnetizing* any ship, but more especially an iron ship, may be looked on as a myth; like the ignis fatuus, a mere deception; and the discreet seaman will always take care to allow for the deviation of his compass, as we have always maintained he should do, finding its amount, as well as he can, by the various means to which we have occasionally alluded; among the last of which are Burdwood's Azimuth Tables, published by the Admiralty a year or two ago.

NOTES ON NOVELTIES.

SHALL we look abroad for them or nearer home? Among the latter reduction is the order of the day, as our Dockyard artificers too well know—for "the besom of economy" has borne hard on them. And yet what else is to be done: no one has told us or Naval Ministers how to "make a silk purse of a sow's ear." So reduction must have its way. The prints of the day speak volumes of the suffering that must

follow our Dockyard reductions. The weird influence of the great change brought about by the formidable question of *iron versus wood* in our future fleets is now exercising its most malignant effect. The flower of our wooden navy is but dross in the market, little better than chips, although chips of the old block, gone, irrevocably gone to the shades below. Here is a melancholy picture, and yet that by its side of such concerns across the Atlantic, they seem to fare little better. We have always been told to buy in the cheapest market and to sell in the dearest, but when we suddenly turn merchants and are for selling off our supernumerary goods, we must take the market as we find it, as the following will show. Here is enough to make Britannia sigh for her navy. What would our naval heroes of old say to all this. Would she find any consolation in the account of her rival sister's muster across the Atlantic. Time was—well, never mind—neighbour's fare is some consolation. The heart of oak was hard but the heart of iron is harder still.

THE BRITISH NAVY.—A return was published yesterday of steamers and sailing vessels sold by the Admiralty since July, 1859, stating the ages of the ships and of their engines, the number and weight of spare screw propellers, the tonnage, horse power, and the amount of money obtained for each vessel. Particulars are also given as to the nature of the sale, the purchaser, and the sum repaid by the Admiralty for the re-purchase of stores bearing the mark of the broad arrow. To these details is added a copy of the official reports relating to the sale and valuation of those vessels. It is, perhaps, to be regretted that the original cost is not stated, but it is obvious that many of those once famous men-of-war whose glory has departed, have been sold at what may be said to be "a tremendous sacrifice." We find, for instance, the *Orion*, a screw line-of-battle ship of 3,281 tons burthen, twelve years old, and fitted with engines of 600-horse power, sold as she stood for £8650, and realising scarcely more than half that sum after the repurchase of stores bearing the government mark. Then there are the *Cressy* and *Majestic*, ships of the same class but of less tonnage and horse-power, only 13½ years old, and considered to be effective vessels when England was called upon to "try a fall" with Russia—they were sold, the former realising a net sum of £991 11s. 9d., and the latter £2410 7s. 9d. The *Brunswick* also a screw two-decker, of 2,492 tons burthen and 400 horse-power, eleven years and

UNITED STATES' SHIPS.—The following expression of the opinion of "A Sailor" in the *Boston Advertiser* contains some ideas, novel on this side of the Atlantic, of the condition of the American Navy:—"The fleet of monitors cannot go to sea, except to dodge along the coast under escort, at six knot speed. Of the straight-sided two-turreted ships of the *Monadnock* class, 1,500 tons, 4 guns, there are four afloat. Maximum speed at a spurt, with several days in the repair shop as the inevitable result, nine knots, sustaining speed, seven knots. All the others are on the stocks—and in the matter of speed will be no better off—seven knots. The British and French war ships have a higher rate of sustained speed by about 75 per cent. than the best of our wooden ships, viz., the *Guerrière*, which left Boston harbour last June for Rio. Eight knots was the safe limit for sustaining speed in her case. Whether or not the *Wampanoag* with twelve boilers and her geared engines can exceed it, remains to be seen, for she is now on a trial trip and is running upon olive oil and Broad Top coal. The United States' naval engines are so unnecessarily heavy that there is of necessity a material reduction of armament. For instance, the engines of the *Guerrière*

three-quarters old, could not, it seems, obtain a purchaser for more than £1995 18s. 6d., while the *Colossus*, two-decker, of 2,590 tons burthen and 400 horse power, sank to a lower indignity still, and fetched no more than £881 19s. 6d.! Frigates of the *Euryalus*, *Imperieuse*, *Arrogant*, and *Termagant* classes, although sold also for breaking up, seem to have been more fortunate in the prices they obtained; the former, a fine ship of 2,371 tons, which had the honour a few years ago of bearing Prince Alfred on his trial cruise, realising a net sum of £5353 6s. 8d., and the latter, the smallest of the four, sold for £4324 16s. 9d. The most startling fact for the British taxpayer is that the price tendered for the purchase of thirty-two steam-ships, including many that were the pride and glory of the country during the war of 1854-5, and one magnificent three-decker (the *Marlborough*) which four years before was serving her first commission as flagship in the Mediterranean—the sum offered for all these was not nearly equal to the cost of a single first-rate ironclad of the British fleet at the present time. For these thirty-two vessels Messrs. Castle and Sons and W. P. Beech offered only £250,110, the vessels to be sold as they stood, including all stores on board, and without any restrictions as to returning old copper and other metal. In making his report to the Admiralty, upon this offer, the Controller of the Navy expressed an opinion that it was worthy of consideration, but said that it required amending in several particulars. The Controller thought that the highest price obtainable had not been offered by Messrs. Castle and Beech, and other terms were proposed by that official, and other contractors were invited to send in tenders. From the storekeeper-general's report we learn that the cost of five out of thirteen ships proposed to be sold immediately was (including machinery) £513,474, and the total amount offered for them was only £31,505, or about one-fifteenth of their original cost. The same authority tells us that the approximate cost of seven ships of the line and six frigates, including machinery, was no less than £1,313,223, whereas we find the actual sum realised on the sale of these vessels did not exceed £50,000.—*Express.*

are 295 tons heavier than the best steam engineering practice says is requisite. This superabundant weight could be added to her battery. The *Wampanoag's* engine is, by the same authority, 460 tons too heavy, and we cannot afford to run it with *olive oil*. The *Wampanoag's* engine and twelve boilers cost about a million of dollars. We are promised *five* more of them. The *Guerrière's* cost less, and we are promised twenty of these. Let all these be captured by the *Warriors*, *Oceans*, *Napoleon Third's*, and the brag will be taken out of the universal Yankee nation. We spend money to arrive at this end, for our vessels have not guns in sufficient number to fight, no speed to run, no speed to overtake. Did we not see the *Niagara* and *Sacramento* balk before the *Stonewall*, which to the *Bellerophon* or *Minotaur*, or *Ocean* is as a cockboat to the *Great Eastern*? Great Britain and France built the engines for their ships on the competitive principle, and patronize the genius or skill of the country. The United States don't. There is the difference; and when we go to war with a power which is a naval fact, we shall get a blow between the eyes when it will be too late. We now are living upon the fame of having come out of a war, with an enemy that was no naval power; but having secured one small 1,000-ton steamer, it defied our whole Navy, until Semmes saw fit to show fight, and to seek it. He could have run much faster than the *Kearsage* could have run. Our naval commanders have heretofore been equal to every emergency. It would be too much to send them in search of fast, formidable *Warriors*, *Oceans*, etc., in such costly gim-cracks as the *Wampanoag's* and *Guerrières*, jogging along seven miles per hour. They could catch an iceberg surely at that rate—if not Dartmoor Prison."

Whatever may be the condition of our *Warriors* and their iron squad, John Bull knows too well than to boast of them, not even of his *Northumberland*, for he has not yet found the model iron ship, as the Chief Constructor of our Navy clearly shewed in the paper, entitled Long and Short Iron-clads, and which paper is so important that we must introduce it here, if even to the exclusion of other matter which we must in such case reserve for our next number, first preserving an account of the Dry Dock at Demerara that may be of service to some of our readers.

Dry Dock at Demerara.—It will interest Masters of ships trading to the West Indies to learn that one has been opened at Georgetown, Demerara, by Mr. Sproston. Ships of a length not exceeding 230 feet can be docked there, it is said, with facility. The depth of water on the sill is 11 feet at high water of spring tides, and 9 feet at neaps. All the needful appliances necessary for the examination and repair of wood or iron ships are obtainable, and a foundry is in course of erection. The leading Mercantile and Shipping firms in that colony have signed a paper recommending the appointment by Underwriters of Surveyors at the Port of Georgetown to issue certificates to vessels repaired or examined at the dock in question; and the Governor of British Guiana certifies to the desirableness of the object. Sproston's Dock, is at present, the only one in the British West India Possessions, and the first vessel overhauled there was the *Tartar*, of London, of 545 tons.

Long and Short Iron-clads.—The important question of the forms and proportions of iron-clad ships formed the subject of an interesting discussion on the evening of the 19th March last, at the Royal Society, Burlington House, where a paper was read upon the subject by Mr. E. J. Reed, Chief Constructor of the Navy. The object of the paper was to show that the proportion of length to breadth in a ship, and the form of her water lines, should be made in a very great degree dependent upon the *weight of the material of which her hull is to be constructed*—that an armour-plated ship, for example, should be made of very different proportions and form from those of a ship without armour, and that as the extent and thickness of the armour to be carried by a ship are increased, the proportion of length to breadth should be diminished, and the water lines increased in fulness, otherwise the ship will be made of enormous and unnecessary cost. In order to support this view the author gave three investigations.

The first was based on the hypothetical cases of a long and a shorter ship, both of which are prismatic vertically. The horizontal sections of the long ship are formed of two triangles set base to base, and the length of the ship is seven times her breadth. The length of the short ship is five times the breadth, the middle portion being of parallel breadth for two-fifths of the length, and the ends being wedge shaped. It is then shown (under certain assumed conditions of engine-power, coals, and stores carried, etc,), that if a ship, having the form and proportions of the long ship, were built of such scantlings that

her sides might be taken as having a uniform thickness of twelve inches of solid iron, and the bottom considered to be weightless, her length would be 581 feet, her breadth 83 feet, her displacement 17,270 tons, and she would require an indicated horse-power of 2,450 to drive her at a speed of fourteen knots.

If the form and proportions of the short ship be adopted, a similar process to that followed in the preceding case showed that the length would be 342 feet, breadth 68½ feet, displacement 11,750 tons, and the indicated horse-power required to drive her at 14 knots 9,359. The second investigation was based upon the official reports of the measured mile trials of the *Minotaur* and *Bellerophon*, and upon calculations made from the drawings of these ships. The assumption made was that a new ship is required which shall carry twice the thickness of armour carried by these ships. As before, certain conditions were assumed to hold for engine-power, coals, stores, etc. It was then shown that if the new ship were built on the *Minotaur* type, and had the same mean draught and depth of armour as the *Minotaur*, the length would be 510 feet, breadth 75 feet, displacement 15,450 tons, tonnage 13,770 tons, and the indicated horse-power at a speed of fourteen knots, 7,560 horse power. If she were built on the *Bellerophon* type, it was shown that with the same indicated horse-power the same speed can be obtained, and the same thickness of armour carried on a length of 380 feet, breadth 71 feet, displacement 10,950 tons, and tonnage 8,620 tons. The original cost of the ship of the *Bellerophon* type would be considerably more than a quarter of a million sterling less than that of the ship of the *Minotaur* type.

The third investigation was purely theoretical, and consisted of a determination of the dimensions which would be required in two ships, of which the horizontal sections were curves of sines, and which were prismatic vertically, if they were built of the same weight per square foot of hull as the *Minotaur* or *Bellerophon*, but carried twice the thickness of protecting material. Under certain conditions it was shown that if one of the ships had a length of seven times her breadth, the dimensions required would be—length 585 feet, breadth 84 feet, displacement 17,600 tons, and indicated horse-power, at a speed of fourteen knots, 8,890; but if the second ship had a length of only five times her breadth, the dimensions required would be reduced to length 425 feet, breadth 85 feet, displacement 12,870 tons, and indicated horse-power at fourteen knots 6,860. It should be added that Professor Rankine's rule for the calculation of horse-power was employed here.

These investigations served to show conclusively that, whether we adopt the theoretical best form of ship, and apply the most recent rule in our calculations, or whether we base them upon the actual trials of existing iron-clad ships, we, in either case, find that the speed of fourteen knots can be obtained in the shorter type of ship at a surprisingly less size and cost than the long type of ship requires.

THE SUEZ CANAL.—In this fortnight's *Revue Contemporaine* we find an article by M. Amédée Marheau, in which he examines the advantages or drawbacks the passage by the Suez Canal may offer. If

distance only were to be taken into account, there could be no question about it; but unfortunately there are meteorological considerations which, at certain points, will render the new route difficult for sailing vessels. The winds of the Mediterranean and Red Sea, though favourable from March to October, will be the contrary during the winter season, for the out-passage to India. The opposite will be the case for the home voyage. It has been calculated that the present average time required by the Cape of Good Hope, starting from the Lizard, is, in summer, 106 days for Ceylon, 107 for Singapore, 102 for the Straits of Sunda. By the Suez Canal the figures will be respectively 55, 77, and 70 days. But, in doubling the Cape, the vessel saves the 10 francs per ton it would have to pay in going by the canal, which, for a ship of 650 tons, makes a saving of 6,500 francs. Now, the daily expenses of a sailing vessel of that burden being 340 francs, the above sum represents nineteen days' navigation, a difference to be taken into account in calculating the relative distances of the two routes. It will then be found that during the winter season the advantages offered by the canal for the out passage are, owing to the monsoon, much smaller than in summer. For Java no time at all will be gained either way, and for Ceylon there will be an actual loss of eleven days by Suez. Nevertheless, deducting these from the above nineteen, the vessel going by the shorter route will still have arrived a week earlier than the one that has doubled the Cape, and will thus be enabled to forestall her competitor on the market, if, as is usually the case, that be an object.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, *in April*, 1868.—*Sold by J. D. Potter*, 31, *Poultry, and* 11, *King Street, Tower Hill, London.*

1182. DE m = 4·0 England West Coast, Cardiff and Penarth Roads, Captain E. Bedford, R.N. 1866. 2s. 6d.

213. $\frac{DE}{2}$ m = 3·7 Denmark, Grön Sound entrance, Danish Survey. 1864. 1s. 6d.

2085. DE m = 0·30 Africa, East Coast, St. Francis Cape to Great Fish point, Staff Commanders Skead and Stanton, R.N. 1867. 2s. 6d.

54. $\frac{DE}{4}$ m = 8·0 Africa, East Coast, Darra Salaam Harbour entrance, Commander Bradshaw, R.N. 1867. 6d.

1021. DE m = 0·5 Australia, East Coast, Port Jackson to Port Stephens, Captain Sidney, R.N. 1866. 2s. 6d.

1384. $\frac{DE}{2}$ m = *various*. South Pacific Ocean, Loyalty Islands' harbours. H.M.S. *Fly*. 1850. 1s.

EDWARD DUNSTERVILLE, *Commander, R.N.*
Hydrographic Office, Admiralty, 20th April, 1868.

TO CORRESPONDENTS.—We have to thank M. J. E. Cornelissen, the Director General of the Nautical and Meteorological Institute of the Netherlands, for his Neaps of the Temperature of the Sea at the surface near the South point of Africa, at the different seasons of the year.

The *Madeira's* letter received.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

JUNE, 1868.

Currents in the China Sea and Passages against the Monsoon.

[A clear and concise general view of the various currents of the South China Sea, that are peculiar to that sea, as produced by the different monsoons, and affected by its numerous islands and shoals, cannot fail of being acceptable to the navigator. Our correspondent, in command of a Hamburgh ship, herein offers his brother seamen the result of his experience in making passages therein against the prevailing monsoon, and by his account to many of his brother commanders whom he met with abroad, this experience would be highly welcome. An acquaintance obtained by making no less than thirty-five passages up and down that treacherous sea, is well entitled to respect; and although many of our readers are old hands in that navigation, it is for the inexperienced to look to the advice of Capt. Polack, and to follow those principles of profiting by the eddy streams in it, where a consideration of the subject will suggest that they prevail, and turning them as he has done to a successful account.

Such a question as the bewildering currents of the China Sea, cannot be too often agitated, until those currents are thoroughly known; not only in the light winds that occasionally prevail in different parts of it, but also in the full violence of the fiery Trade wind, for at either time it is perhaps not easy to know when they are most dangerous to ships.

Captain Polack's letter was accompanied by two charts one for each monsoon. But as the principle observed by Captain Polack is that of following the eddying current produced from the main current striking a shoal or an island, or projecting cape, we have not considered it necessary to repeat his chart, as his descriptions are sufficiently clear without it.—Ed. *N.M.*]

Hong Kong, 5th November, 1867.

Sir,—Although there is a fast and still increasing trade from China to Saigon, it is astonishing how very little this voyage up and down the China Sea *against the monsoon* is yet known and understood in general. For the greatest difference of arriving in China (as to time) exists in this little Saigon voyage of only about 1100 miles distance. Ships which are acquainted with the voyage here make it in nineteen to twenty-three days, while the greater part not being well acquainted with it, require between thirty and forty-five days. A barque in 1865 took one hundred and ten days, and worse than all, another actually returned this year back to Hong Kong after having been out about sixty days, declaring it impossible to reach Saigon in the S.W. monsoon. As I have made now fifteen voyages from Hong Kong to Saigon and back, and traversed the South China seas up and down, and in all seasons of the year thirty-five times; I hope you will hold me competent enough, and will allow me to give my brother sailors, who do not know the voyage, a little of my experience through the medium of your Magazine, which is, as I know, always open to correct errors and improve nautical affairs.

Leaving Hong Kong in the S.W. monsoon, our first object ought to be to make Southing, and try to reach the North Danger of the Palawan shoals as soon as possible. But as the wind is most generally between S.S.E. and S.S.W. at starting, I nearly always stood W.S.W. and S.S.W. between Isle Hainan and the Paracels even to the East coast of Cochin China, and worked along this coast as far as Cape Varela *(not false Varela)*, always trying to be a good distance, say forty miles off shore at noon, to stand in with the S.S.E. winds generally blowing in the afternoon, until seven or ten p.m. Then stand off with the wind, then veering a little off land, or about S. and S.S.W. *(solar winds)*. From Cape Varela, I invariably stood to the South-eastward over to the Palawan shoals, never thinking of going about, for here my greatest endeavour was to cross the Padaran stream of forty to seventy miles a day to the N.E. as quickly as possible. I then worked along the shoals down to 7° N., and 111° or 110° E. long., and between 7° and 8° N. lat.

I worked from two to four days to the westward, until St. James bore N.W. by N., which I then generally reached in one or two days in one tack. In this track my longest voyage was twenty-three and my shortest nineteen days, at same time when other vessels took fifty and eighty-five days. In this route I generally had the current from Hong Kong (Taytang channel) and Macao, to the South coast of Hainan from ten to twenty-four miles a day to the N.W.; from there to the East coast of Cochin China the current varies between N., N.W., and W. from fifteen to twenty-five miles a day, but on the West side of the Paracels an East current of twelve to thirty miles will be found. On the East coast of Cochin China it runs from ten to twenty miles a day to the N.N.W. and N.N.E., but there is often no current at all. From Cape Varela to the shoals, I generally had the first day when right in the Padaran stream from thirty to fifty (one voyage 70') miles

to the N.E. by E., but from 12° N. and about 112° E., its set is from fifteen to forty miles a day to the South-eastward.

On the shoals there is about 20′ to the S.E., and sometimes to the South, but often no current at all. Between 7° and 8° N. lat., and 110° to 108° E. long. there is little or no current, sometimes even a slight drain to the Westward. But standing over to Cape St. James a strong N.N.E. and N.E. by N. current of thirty to thirty-six miles a day will be found, while South of St. James it runs E.N.E. along the coast from P. Oby to Padaran.

Should the wind at starting from Hong Kong be from the S.W., stand down S.S.E., never think of going about till in 15° N., unless the wind should break off too much. In this track in the open sea, there is generally not over twenty miles a day of a N.E. current, especially after the strong E.N.E. China coast current extending sixty to seventy-five miles South of Hong Kong is crossed.

South of 15° N. lat., and in 115° E. long., or to the East of it, is very little current. I always give the preference to the inside track, for here the winds are more variable, the sea smoother, and getting the chance of a W. or N.W. squall from land. Besides this, a vessel reaches the Palawan shoals sixty to eighty miles further West, and Westing is very difficult to make there, especially after July, when the S.W. monsoon blows from W.S.W. or West.

This voyage as explained here, is quite plain and simple, but if asked, Where were the other vessels who took from fifty to eighty-five days in their passage? There is but one general answer. They tried to round Cape Padaran. Here they were lying for forty consecutive days, sometimes with a dozen and more ships together. This year a barque took thirty-five days from Japan to Padaran, but sixty days from there to Cape St. James, running short of everything, and had to be provisioned by other vessels. They sometimes go as far as Sapata, but never thinking, that bound to St. James in 10° 10′ N. they ought to go due South as far as 7° N. lat., and even ships on the shoals in 9° or 10° N. and about 111° East, get tempted to stand W.N.W., intending to pass between Sapata and P. Ceicer. But when making the land, they find themselves between Padaran and Varela.

I know several instances of this. Or that a ship made a N.N.E. course sailing W.N.W. Although some vessels did make Padaran and made a good passage (assisted perhaps by a N.W. squall), they form an exception, and may not do the same again in ten more voyages. Whereas the track along the shoals, and although about 300 miles longer, is pretty certain.

My short advice therefore is, go either E. or W. of the Paracels, and make the shoals of Palawan as soon as possible. A ship taking the inside route should work between the Cochin China coast and 40′ off it, but should not remain there in the night, as there is seldom a land breeze, but much calm. Having reached the shoals as aforesaid, work along them, standing to sixty miles off. Never think of Padaran or Sapata, and don't leave the shoals unless in 8° or 7° N. lat., as stated before, or you will surely be disappointed.

In the N.E. monsoon, and bound from Saigon to China, stand out to the S.E. and tack, even if the wind should be from East 40′ off the land. The wind will haul up to E.N.E. and N.E., then try to pass the S.W. current (which runs the first day at the rate of thirty to forty miles) as fast as you can; for about one hundred and fifty miles S.E. by E. from St. James in about 8° 30′ and 109° E. the current runs already to the E. and E.N.E. Working along the shoals, between them and sixty miles off from lat. 9° N. as far as North Danger, about seventy-five miles off will be right in the fair N.E. and Northerly current (right against the wind), but I am inclined to believe that a ship should not go nearer the shoals than about twenty miles from them, because the Northerly current extends not so far East, for I often found there no current at all. From North Danger to about 119° East, an Easterly current from ten to forty miles will be found. But in the early part of October the current off the North Danger runs from ten to fifteen miles to the S.E.

Along the West coast of Luconia the wind is from N.N.W. to N.E., and East with fine weather and fifteen to twenty-four miles current to the North, but from Bolina it blows generally heavy with a high, short Northerly sea. If the first puff off Bolina is passed, and one hundred or one hundred and fifty miles are made to the N.W., the wind and sea are getting more handy and regular, and change one or two points farther to the East. But the ship wants canvas here, and must be in a good and sound condition, for the sea rises here in short and high pyramids, on account of the hitherto uninterrupted Northerly current, assuming here a velocity of fifty-two miles a day to the N.W. by N. and N.W., and running oblique to the N.E. sea. My longest voyage in this track was twenty-two and my shortest nineteen days from Saigon to Hong Kong. In February and October, a ship should not go East of the Scarborough shoal, for in February it is not necessary, and in October there will be nothing but calms and a high Northerly sea running.

This voyage against the N.E. monsoon is sometimes very easy, and done in less than nineteen days. But it is in general a difficult task, especially in November, December, and January, and requires a good ship and plenty of canvas on her, especially on the West side of the Palawan shoals, where the sea, running right against a N. and N.E. current is as high and short here as from Bolina to the Pratas. But many ships in this voyage commit a great error in working along the South coast of Cochin China and try to get out of Padaran, which is nearly impossible on account of the strong W.S.W. current and always very short sea.

After reaching Cape Bolina and finding the above mentioned stiff gale and tremendous high cross sea, and thinking it blows a heavy gale all over to China, ships make a second mistake by creeping under the land again and waiting there sometimes for a fortnight, expecting better weather. And this is the same case with many ships South of Formosa when bound North along its East coast.

My advice therefore is, stand boldly out, and remember, that the

current will assist you first with fifty and afterwards with twenty miles a day to the N.W. by N., as far as the Pratas. And at sixty miles from the China coast the wind will be about E.N.E., and sea moderating as you close the South China coast. But keep the first day from Cape Bolina good rap full, even if you head the first day to leeward of Hong Kong, and should a ship really fall to leeward of Taytang channel, let her proceed in at the Ladrones, from which Hong Kong will be reached in one day. If bound to Swatow, Amoy, and the Northern ports of China, work as far as Cape Bayadere, and then stand out N.W. or N.N.W., making long legs to the North and short ones to the East, especially for the first one hundred and fifty miles, where the strong N.N.W. current will be under your lee. South Formosa will generally be reached in three to four days, from whence to South Pescadores, and over to Swatow and Amoy is plain sailing, and will be reached in one tack.*

Bound to Fou-Chou-Foo and further North, ships have to pass round the South Cape of Formosa, and work to the Northward East of this Island, where the Curo Siwa current will assist them from forty miles a day, decreasing to twenty as they advance to the Northern boundary of the current in about 28° N. and 125° E. long., from where Shanghae is reached without difficulty. But always remember that the cold water current runs strong to the South on the E. coast of China. Bound to Fou-Chou-Foo they may cross over from 26° N. lat., and about 122½° E. long. in one tack.

A voyage up and down the China Sea with the monsoon presents no difficulty, but I would advise Captains of ships to pass East of the Paracels, for in the S.W. monsoon the winds there are more steady and fresh than inside, or West of them, and a vessel has more sea room in case of a cyclone. After having passed to the West of Macclesfield Bank, steer a N. by W. or N. by W. ½ W. course, on account of a N.E. current, and the winds blowing often from W S.W. and West. December and January, and in some years the latter half of November, are the only months in the N.E. monsoon that I would advise to pass inside the Paracels when bound South, but which ought never to be done from February to the end of May on account of calms, and always lighter winds than in the open sea. I never went inside in these months, but gained on ships which did so, from eight days to a fortnight in the months of March, April, and May bound South, as well as in the S.W. monsoon from June to September when bound North.

Every one who has perused the foregoing attentively, will perceive that it is not the wind only that causes the long and troublesome passage, but that we have to consider the current as our greatest enemy. And as it has been my principal object from the beginning to

* It strikes me as remarkable, that in a work like Horsburgh, of 1864, so great errors should still exist. For in the chapter, "Passage through the China Sea, to or from Canton River," we read, "If bound for Amoy proceed East of Formosa as far as Shanghae." Now this is either a misprint or great mistake, and will mislead an inexperienced commander sadly.

make myself thoroughly acquainted with the subject, I beg leave to trouble you a little longer, and give you a slight illustration of my views about it, founded on the experience of my voyages.

In the first place, I am positive when I assert, That the whole current of the South China sea is nothing but a large *circular* stream, in which the waters running from South, have to pass up North, in order to return down South again. Coming from the North through the Formosa channel, and from the East by the Bashees, the first getting compelled by difference of specific gravity, and accelerated by the N.E. monsoon, it rushes down to the S.W., without finding material obstruction, until met by Capes Varela and Padaran. Here its waters are turned off to the South, part of them or the Northern branch runs W.S.W. along the Saigon coast to Pulo Obi, and crossing the Gulf of Siam to Malacca; the main body after having passed Padaran, resumes its course to the S.S.W., but the South-eastern part branches off to the South as far as 8° N. and 109° 20′ E., from where it runs to the E. and E.N.E. as far as 9° N. and 110° E. There it turns N.N.E. and from 10° 30′ and 111° 20′ E. to the N.N.W. into its own whirl again, to give place to new waters of the great counter stream or whirlpool. This explanation may be new, but it is, I fully believe, quite true, for I found it every voyage, bound North in the N.E. monsoon, only differing a little in force and direction according, perhaps, to the prevailing strange or light original main current. The E.N.E. and N.E. current or the first bend in this whirl runs strongest, and from twenty to fifty-one miles a day, decreasing as it advances North to about twenty-five and fifteen miles when its direction is N.N.W. I consider this branch 50′ broad, and the diameter of the whole whirl, from Padaran to its Southern extremity, about one hundred and eighty miles, and from Padaran to the S.E. about one hundred and forty miles.

If this whirl did not exist, how should we account for the strong N.E. current against a strong N.E. monsoon (and for the ALWAYS sharp set about Sapata which we experience, and which Horsburgh and the China Pilot mentions), sometimes when the China Sea current to the N. and S.W. of this whirl runs at the rate of forty to eighty miles a day to the South-westward. This latter current I had in October, 1866, coming down from Hong Kong with the commencement of the N.E. monsoon, or why is there not a N.E. current in the N.E. monsoon, for instance, on the Macclesfield Bank, or at P. Condore as well? After this current of the aforesaid main branch has run down to the Natunas, etc., it gets obstructed again on the coast of Borneo, by which a slight drain to the East is caused, running along the North coast of Borneo, through the Palawan passage (assisted perhaps by a part of the aforesaid Eastern counter current of the Palawan whirl), and along the West coast of Luconia, to run from Capes Bolina and Bayadere N.N.W. in the great China circular current, and commence its round viâ Padaran again.

This circular whirl-current about Padaran is the same in the S.W. monsoon, but in a contrary direction, but not so constant and regular

as in the N.E. monsoon. H. B. M's. surveying vessel the *Rifleman* found the same amongst the Palawan shoals, where the commander says, "The stronger the monsoon, the stronger the current to *windward*," and this is according to the whirl-theory quite conclusive, for the greater and stronger the original stream, the stronger the counter current and the larger the whirl (and the stiffer the monsoon, the stronger is the China Sea current). I have often seen and noticed in the Saigon River, when the ebb tide runs at the rate of five knots an hour, in the middle of the river, after turning a sharp corner it causes a great counter current or whirl, in which the waters run two or three knots up the river close alongside the five knot ebb tide, so that a boat, and often my own vessel when in it drifted up the river at the above rate. And when a small river can produce such a strong whirl, what may not the mighty mass of the China Sea current be able to do? At all events I never found it necessary with the above N.E. current in the N.E. monsoon to take the Palawan route, and my results have shewn that I never was behind, but generally ahead of those vessels which did take that dangerous Palawan route.

This whirl-current to the west of the Palawan shoals may also account for the different currents found by vessels which are working there at the same time, where one ship beats right in the counter stream, whilst the other is too far West or inside the whirl, or too far East and out of its influence altogether. And these little whirls are to be found around all the shoals in the China Sea, and although Horsburgh recommends passing to leeward of all shoals, I have great reason from my own experience for cautioning captains even there. To leeward of the Pratas I found on two voyages the current setting East, or right on the shoals, against a stiff N.E. monsoon in the months of December and January.* Although this is the general current, it is nevertheless liable to great irregularities and changes, in force and direction, and perhaps more than anywhere else, which is not at all surprising in a small sea like this, full of islands and shoals, and entirely enclosed by land, causing different winds on either side of it, and on which the current so much depends. For sometimes it blows a stiff N.E. gale to the north, while it is calm south of the Paracels, and commanders expecting perhaps a slight current, are surprised to find one sometimes of fifty miles by observation, but in eight cases out of ten the above explained current will be found pretty correct.

And lastly, I take the opportunity to caution captains against trusting too much to red or green lights when in the vicinity of the Pratas and Paracels, for they are often exhibited by wreckers and pirates, especially at the Pratas. I once observed a green light to windward of me on the west side of the Pratas. I kept four points off, and being a clear night I went aloft with my glass, and saw two junks, one of which carried the light.

* It was this current that was fatal to H.M.S. *Reynard*, in 1851, as related in our Volume for 1852.—ED.

If you think the publication of this will be of any use, please grant me a space in your Magazine, and oblige, yours,

A. POLACK,
Master of the Hamburgh barque Madeira.

[Shipmasters will be thankful for the much useful information contained in this paper.—ED.]

NOTE.—The specific gravity of the South China Sea is 1018 at 82° Fahrenheit, whereas that of the North, and through the Formosa Channel, is 1026 at 50° Fahrenheit.

A JOURNEY IN TRINIDAD TO THE SUMMIT OF TAMANA.

By Commander W. Chimmo, H. M. S. Gannet.

THE general figure (on the chart) of the island of Trinidad may be considered a rectangle, with its sides towards the cardinal points. Three parallel ranges of hills cross the island from east to west, all thickly wooded; two of them close to the north and south coast respectively, and the third mid-way between them. This latter ridge is so exceedingly broken that the middle and highest peak of it is a lonely mountain named Tamana, 1025 feet above the sea, commanding a magnificent view of every part of the island, and more especially of the loftier northern range, the peaks of which supply admirable points for the purposes of the nautical surveyor. Cultivation, however, has unfortunately not yet reached beyond the banks of the Caroni River, which rising in the northern mountains flows along their base to the Gulf of Paria.

The whole of the country surrounding Tamana is covered with dense tropical forest, rendering approach to it so difficult, that some years ago, runaway slaves who had formed a kind of colony there were considered as altogether beyond the reach of the proverbially long arm of the law!

The loneliness however of Tamana, like Japanese exclusiveness, was at length to be invaded, for purposes of seamen and science. The governor approved, and the warder of the district received directions to clear a road through the jungle, which for many years had known no other noise than the crash of falling trees, or that of chattering monkeys and screaming parrots.

The mail road served us as far as Arima, a small town sixteen miles due east of Port Spain, the capital of the island, and off which lay H. M. S. *Gannet* at her anchors. A long continued drought led us to hope that we should not be impeded by bad weather, but before we reached Arima there were abundant signs of rain to windward, beneficial no doubt it would be to the sugar cane, but ruin to our purpose, which required distinct objects as they are seen in clear weather.

At Arima we found as much assistance as we required in the way

of half-cast Spaniards and negroes, willing to engage in transporting our traps, instruments, etc., and even to clear the summit of Tamana on arrival, so that our party, when we left Arima, consisted of sixteen persons:—five naval officers, besides the botanist of the garden at Port Spain (a most valuable companion, being well used to travelling in these woods), one seaman, and ten creoles.

In the early morning of December 2nd we started on our mission in the midst of rain, with the assurance that everything had been so dry before, that the rain would merely lay the dust and close up cracks, so that we should certainly find no difficulties. At the end of the first six miles, through a thick wood, we found the Caroni River, having passed over a tolerable road with the frequent recurrence of pools of water knee deep! No very great promise this as to what we should find on the other side of the river. In fact these pools became worse as we passed through the cocoa plantations that fringe the Caroni; embedding themselves in the richest and most adhesive mud that a traveller might wish to encounter.

After floundering along our tedious way, a heavy squall of rain found us at the ford of the river, where everyone had said it was easy to cross. But how often does everyone prove to be wrong? Here we saw before us a muddy stream forty yards wide, and at least eight feet deep, rushing along at a rate of four or five miles an hour, carrying on its surface numerous logs and branches brought from the hills. How was this to be forded? Proving how little the trumpet tongue of fame was to be depended on. Of course we were disgusted, and more still when we learned from a squatter, who lived on the banks amongst his bananas, that no boat was obtainable for at least four hours! Fording was of course out of the question; therefore a raft was proposed, and while felling trees for the purpose, one of our porters clumsily brought his cutlass across another's foot, and so heavily that he cut one toe completely off, and otherwise severely wounded him. This was a bad beginning, and put a stop to our raft, but by the time we had bound the foot up and despatched the wounded man back to Arima on the mule, we found that we might as well await the arrival of the canoe that had been sent for. The consequence was, that we were detained here five weary hours, but having at length succeeded in crossing the river, with all our belongings, in a crazy little dory that leaked alarmingly, and having moreover had great difficulty in getting the mule across, we again started with fresh vigour, and not without some misgivings as to our prospect of comfort in the approaching night, as the rain squalls succeeded each other so rapidly as to be almost continuous, and our lodging was not promised waterproof.

The style of negro residence in these woods is in the shape of a hut called by the natives "Ajupa." To construct it some convenient trees are selected for the posts, as being well adapted to bear the weight of the hammock; a sloping framework is lashed on by means of pliant lines, and the whole covered with a roofing of palm leaves, which if well and carefully laid on is perfectly waterproof; the sides being left open to the breeze. The rapidity with which these huts

are formed is astonishing, but as the party which had to clear our road had already erected a substantial one at some unknown point between the Caroni and Tamana, we determined on reaching it before we stopped for the night, in preference to losing time in building one ourselves.

Our future road lay over a succession of hills averaging one hundred feet in height, with steep sides and intervening valleys, the sides of which had been rendered excessively slippery and muddy by the rain, and the path being covered by roots interlaid like network added no little to our difficulty of travelling. Night had nearly darkened our way before we arrived at our resting place, the difficulties of the road being thereby rendered still more trying, and some of our party were so disheartened by the impossibility of finding out how far we were from our destination (for our guides, like all West Indian negroes, had no idea of distance, or even of giving a straight answer), and tired by this unusual exercise, they even wildly proposed to stop where we were all night. This no one would accede to, and their proposals were happily overruled; so at length, in straggling line, we came upon our camp, built close to a little stream, and moreover surrounded by a pool of water, which of course we attributed to the rains. However we were too tired to find fault with the situation, and by the time we had succeeded in making a fire, cooking dinner, and mending the roof of our hut, everyone was soon locked in sleep, for although the distance we had travelled from Arima was comparatively trifling (sixteen miles), the latter part of the road had been exceedingly tiresome. We had passed another river, the Arena, some six miles from the Caroni, and as one of the porters, in their usual inaccurate way, had told us it was nearly as big as the Caroni, we were pleased to find it only waist deep, and about ten yards wide, though we still had some difficulty in getting our mule across, on account of the steepness of the banks, which were nearly perpendicular and very slippery. We sent the mule back next day, as we found the animal more troublesome than useful, distributing the load among our porters, who, though they objected at first, did not seem to care when once on the march, but travelled along under a weight of fifty or sixty pounds as merrily as possible.

Next morning we started considerably refreshed, and with the certainty of no more rivers to check us, and with the exception of some slight difficulty in making the train of porters keep together, we arrived easily at the ajupa at the foot of Tamana at eleven o'clock, passing, about two miles from the mountains, a small river called Tumonti, which flowed to the eastward; whereas Arena and Caroni run in the opposite direction. Our path had one great advantage; it was under dense high forest, too thick for the sun to penetrate, and at the same time prevented the low, compact brushwood from springing up as it does, when unshaded by tall timber. We noticed several gigantic trees, one we estimated, at about twenty-five feet from the ground, and about the buttresses that ran from its base, to be fifteen feet in diameter; this was a silk-cotton tree (Bombax): another (a

Ficeas), the buttresses ran to a distance that we calculated to be about sixty feet from the trunk.

The ajupa we were now at was said to be three quarters of an hour's journey from the summit of Tamana, from whence our object was to measure a variety of angles for the survey of the island; so that another ajupa would be required as close to the summit as it could be, where we could more easily reach the scene of our future work. But for some reason there was no fancy for this. Our men stoutly at once raised strong objections to our plans, and no less than two insuperable difficulties! It was first alleged that there was no coral or other palms for roofing an ajupa growing on the mountain, and there was no water nearer than where we then were. As no one could deny this, we at all events determined on going up with our men to choose a spot for observation, clear what we could of the trees, ascertain if we could build an ajupa on the hill, and return for the night to our present home.

The very first thing in our ascent that struck us was the unusual quantity of the very palm we wanted, and again about one hundred feet from the summit we actually found a small stream which certainly would not have existed had it not been for the rain that had fallen so continuously, that we had made up our minds, as a matter of course, to be wet all day. However it did not take long to select a position for the theodolite. The very highest part we found would not do, as the ascent to it was so gradual that it would have taken weeks to clear the ground sufficiently, but fifty feet lower on the N.W. end of the ridge we fixed on a place where we ultimately obtained a range of the horizon of 260°, the part that was really obscured fortunately was not wanted. Thus were our difficulties of all kinds dissipated. Part of our men, therefore, proceeded with the clearing, whilst others commenced the ajupa in a convenient situation below the ridge, so that by the time we again started for the foot of the hill, we had made such a hole through the leafy screen, that we could recognize a tolerably fair share of the northern range of hills.

This afternoon we were treated to the howling of the great red monkeys which infest the neighbourhood. It has a dismal sound, that howl of theirs, rising sometimes, when several join in concert, to an assemblage of yells, which at night is particularly unpleasant. We sent several parties after them, but the animals are so wary that the sportsmen never succeeded in catching even a glimpse of them, and though we heard them frequently afterwards, the same luck attended all pursuit of them.

The next day our travelling traps were moved up the hill, after some more opposition from our lazy carriers, when lo! the true reason of their objections to staying on the summit oozed out: they were afraid of falling trees on the exposed side of the mountain. There was some sense in this, more than one would have expected, but it had to be set aside, and with threats of pecuniary deductions they were at length induced to join us and take their chance, and we thought no more of it until the last night when we were awoke, in a

heavier squall of wind and rain than usual, by a loud crash near us. Nothing fell, happily, close to the camp, but we heard more than one tree falling in different parts of the mountain, and, certainly, on our return found several across our path. So that we might say of our working hands *experientia docet*, and theirs was better than ours.

The work of clearing now proceeded rapidly under the well directed labour of six axes, and among other trees several giants of five or six feet in diameter, noble cedars they were, fell in succession, carrying destruction far and wide as they crashed down the steep slopes of the mountain, which is here nearly precipitous on one hand, and sending flocks of green parrots and other birds screaming through the air at being thus unceremoniously dislodged from their haunts.

As our arc of sight widened, another obstacle, and the one we most feared, presented itself. This was the constant interruption from squalls of rain passing between us and our object, obscuring everything, and rendering recognition of the few peaks that now and then shewed themselves very difficult, as the view we now had of them was a new one. Their outlines were materially altered, so that what were the different peaks we saw (unless several peaks appeared together) was very uncertain. The theodolite was got in position this afternoon and a small roof erected over it, to protect it from the rain, but we were not able to obtain a single angle, although the whole of the clearing was accomplished before evening. We slept in our new ajupa that night, and thanks to our friend the botanist who built it, we had the satisfaction of finding it proof against the storm of rain that occasionally poured down over us. I can conscientiously say that during the whole time we were away from Arima, we were never dry, except when we changed our garments for sleep, and not always then.

We were at our station next morning soon after the sun was up, yet alas, there was nothing but a blank prospect of rain and mist before us, and this miserable obscuration lasted all day. One of our party was always on the look out for an occasional peak appearing till 3 p.m., when it cleared a little, and shewed us all the western portion of the range, and later still it cleared to the eastward. But the peak of Aripo was still an object of anxiety with us. It is one of the highest in the island, and stands in the midst of the range. But its stubborn fate kept it from our gaze. It never cleared the whole time we were on Tamana, nor could we get a single glimpse of it. It was a sad disappointment apart from making our work less satisfactory, for not only would the view have been magnificent could we have seen it all at once, but also useful in the highest degree. Next morning, after an hour spent in hopeful expectation of seeing Aripo, but in vain: so, tired of waiting for it, we packed up our traps and started disgusted for Arima.

Tamana had been described to us as the great retreat and chief centre of all the unpleasant noxious insects and dangerous reptiles to be found in the island. But how often do stories gain by telling! Here we did not find anything. For the five days we were in the woods even I, myself, never experienced a mosquito bite, though a

few of the party did complain of them one night; and only one snake was seen, a large mapapire, a really dangerous species, where we were to have seen I don't know how many! The fellow lay coiled up in the middle of our path, and was so fast asleep that it did not even wake when one of the men stumbled and fell close to it; the man started up in terror, but a shot from a gun knocked the reptile's head off before he moved. Certainly he measured six feet in length. A scorpion along with this completes the short list of poisonous vermin that we saw on Tamana. Of animals, we found none save an Agouti, which ran through the camp one evening, but the noise we made felling the trees no doubt effectually scared everything away.

This mountain of Tamana is about 1020 feet above the sea, and 750 feet above the surrounding country. Yet from its isolated position it appears much higher. It rises gradually from the eastward, but the other three sides are more or less precipitous. Numerous gullies furrow the sides of it, down one of which we found pouring a beautiful cascade, as we descended. It had about a hundred feet of fall, the bed of which, on passing it two days before, was quite dry. A proof how heavy had been the rain, more especially as the cascade was within two hundred feet of the upper ridge. The stream ran through limestone, which it had hollowed out most fantastically.

Our return journey to Arima was very rapid. We all knew the way and the distance also, and were in pretty good training for the roughest of roads. No check occurred, even at the Caroni, as we luckily found a boat at the ferry, so that the same journey that occupied us ten and a half hours of actual travelling when going, was done in seven hours on the way back, and we found ourselves in Arima the same afternoon.

In dry weather and with our acquaintance with the road (the distance is twenty-three miles), the journey would be nothing, and would amply repay the fatigue by the beautiful views to be had from the summit. But I never knew any road more harassing than this, when going to Tamana, probably owing to our untrained condition, our ignorance of the distance, and the very inclement state of the weather in which we had performed our journey.

A LEAF ABOUT JAPANESE EXCLUSIVENESS OF BY-GONE DAYS.

To the tact and good management of our friends of the United States, there is no doubt, belongs the honour of removing the exclusiveness of the Japanese to the outer world. To them only may be considered due in all after time, the credit of opening out that country to the free intercourse of the civilized world, with all the advantages of commerce. Up to the year 1853, when Commodore Perry appeared in Japanese waters, we knew nothing of that very remarkable people, excepting perhaps from the stories told us of them by the few Dutchmen who

were shut up in the miserable island of Decima, contenting themselves with the privileges of an exclusive commerce. Indeed it was only from these Dutchmen that Europe itself had to be satisfied with the small Japanese produce which they sent to it. And the Japanese then knew no other foreign people saving these Dutchmen excepting the Chinese; and even the language of Europe to the Japanese was that of the Dutch! Thus they continued satisfied with each other, busily employed in commercial pursuits. Occasionally the Dutch merchant might be seen at Yeddo, where he and his companions were looked on with the eyes of curiosity, and the strangers being always destitute of all official importance, which might have ministered to their consequence, were contented to play into the hands of the islanders. During the European war when Holland almost ceased to be, her flag still waved at Decima. There nothing in the habits of the natives shews any resentment at the memory of the missionary Catholics, the followers to their land of Francis Xavier; nothing recalls to their minds their ancient influence. The name of Christian serves but to remind them of an abject class of miserable people, betrayed by their countrymen. Persecution has thrown all into oblivion, and it would be difficult to find a word in their language now relating to the ancient terms of commerce, and even the friendship, which in former times existed between them and the Portuguese.

It may be both interesting and useful to turn over a page of history as applied to this very remarkable people. It may be useful to account for that exclusiveness of all the world by the Japanese, that was at length removed by the Americans, and to see the plain reasons why they adopted and preserved it so effectually as they did for two centuries at least. Sir Robert Alcock, who has had abundant opportunity of studying their character, gives a good condensed view of this subject, and it will be seen that the plain reason was that the Japanese determined very wisely to remain their own masters, and submit to no foreign yoke of any kind. He tells us:—

History often furnishes plain lessons of morality as well as policy, to those who can read aright: but it is not often that they are written in such clear and unmistakeable characters, as those supplied by China and Japan. And curiously enough, there is between those two countries, isolated as they have always been from each other, but with which countries Europeans in the sixteenth century had such free and cordial intercourse, a parallelism of wants so perfect in all that took place in remote and immediate causes, and in final effects, no less than in the periods and successive phases, that it would almost seem as though the lesson to be conveyed to mankind for all future time, had been deemed too important to be given only once. It was therefore twice repeated, with different races and under analogous conditions, to make it the more indelible and impressive.

When the three Portuguese adventurers under the guidance of the Chinese junk captain (without any credentials, and all of doubtful antecedents), first made their appearance, driven by stress of weather rather than their own good will, to an unknown coast, this proved to

be the part of Japan owning the sovereignty of the prince of Bungo. The Japanese, although vigilant, manifested no reluctance to admit the strangers: they shewed even much kindness to them, and opposed no obstacle to free trade with their country in the interchange of such commodities as they had brought with them. The natives and these strangers were so well pleased with each other, that by an arrangement of the prince of Bungo, a Portuguese ship was to be sent annually laden with woollen cloths, furs, silks, taffetas, and other commodities *needed* by the Japanese. Such was the commencement of European intercourse and trade with Japan, carrying us back to 1542-5.

It was but a few years later that *Hansire*, a Japanese nobleman, fled from his country for an act of homicide (having run some fellow-subject through the body no doubt), and took refuge in Goa, at which settlement on the Eastern coast of Africa, he became converted and was baptized.

This event proved to be the second link in the chain. The convert was enterprising and shrewd, and probably animated with zeal, he soon persuaded the merchants of Goa (nothing loth no doubt) to commence a profitable trade with Japan, and promised to the Jesuit fathers a rich harvest of souls. Doubtless he preached to willing ears in both directions, and foremost among his listeners was the Jesuit apostle of the East, Francis Xavier, who had recently arrived.

Forthwith a ship was loaded with goods and presents, with which to commence a permanent trade. For the accomplishment of spiritual objects, Frances Xavier himself embarked with the Japanese refugee, and a number of his order as missionaries. Here indeed was a goodly freight; Jesuit fathers to win souls! Merchants to make money! Merchandize for the people and their carnal wants; presents to propitiate the authorities; all were duly provided, and thus auspiciously began the second chapter of Japanese conversion.

The ship arrived at Bungo; all were received with open arms; not the slightest opposition was made to the introduction either of trade or religion! No system of exclusion then existed; and such was the spirit of toleration that the Government made no objection to the open preaching of Christianity. Indeed the Portuguese were freely permitted to go where they pleased in the Empire, to travel from one end of it to the other. The people freely bought the goods of the traders, and listened to the teaching of the missionaries. And a little later it was found that if the feudal princes of Japan were ready to quarrel with the merchant, it was because he would not come to their ports.

Passing onward a few years, the Christianity of the Jesuit fathers was spreading rapidly and generally in Japan. Princes and rulers, nobles and plebeians, women and children, people of all ranks and in large numbers, embraced the faith. Roman Catholic churches, hospitals, convents and schools, were scattered throughout the land. Intermarriages between the Portuguese and wealthy Japanese were frequent. So little had Christianity to fear from the disposition of the governing powers or the temper of the people, that the only opposition they encountered in these early years of promise and fruitful labour,

came from the Bonzes, or native priesthood; and these seem to have been powerless. For we read, that feeling their religion and influence discredited by the rapid adoption of a hostile creed, they appealed to the Emperor to banish the Jesuit and Romish monks; and it is related that the Emperor annoyed by their importunities, asked them how many different religions there were in Japan? They answered thirty-five: "Well," said the Emperor, "Where thirty-five religions can be tolerated, we can easily bear with thirty-six: leave the strangers in peace!"

And after forty years, the Roman Catholic faith was in such high esteem, and had such undisputed possession of the field (no Protestant element having at that time appeared on the scene), that a Japanese Embassy, composed of three Japanese Princes, was sent to Rome to Pope Gregory XIII. with letters and valuable presents. Their reception at Rome was not only magnificent, but their progress through Spain and Italy was one continued ovation. A nation of thirty millions of civilized and intelligent people had been won from the heathen! Great indeed was the joy and triumph, and here was the culminating point of success reached by the Roman Catholic religion in Japan.

How soon were matters changed? In that same hour, while the artillery of St. Angelo answered by the guns of the Vatican was thundering a welcome to the Japanese ambassadors, an edict had gone forth from the Kubo-sama, or sovereign lord of Japan, banishing all Catholic missionaries within six months on pain of death; and ordering all their crosses to be thrown down, and all their churches to be razed to the ground!

When the Jesuit Superior, Pere Valignani, returned with the ambassadors, after an absence of eight years (so long did it take in those days to exchange amenities across distant seas and foreign lands) he found this edict in force, and partly carried out. The old chief of Bungo, the great protector of the Jesuits was dead, his successor ill-disposed towards such matters. All their Christian communities, schools, and hospitals, had been suppressed, and the missionaries dispersed, expelled, or forced into concealment. There are few more striking examples of the instability of human affairs; and it must have been a cruel blow to Valignani, as the Superior of the order, so long happy and successful in his efforts.

We enter now on the third and last phase of this eventful history. The first edict for the banishment of the missionaries was published in June, 1587. All that follows is but a narrative of partially interrupted persecutions, the decay of trade, increasing restrictions, and at last the explosion of all, amid scenes of martyrdom and sweeping destruction. In the year 1685, the Portuguese were shut up in Decima, and only allowed to trade there, amidst, it is said, the jeers and derision of their *Dutch* rivals.

A year or two later the fall of the last Christian stronghold Simabarra, battered in breach by the *Dutch* artillery, under (the Dutch chief) Kockebeker, marked the final catastrophe; and the close

of all relations but the miserable ones allowed to the *Dutch* factory as a reward for the part, we may add, which they played against their ruined rivals in the Portuguese Decima.* Since that date, until recent treaties were signed, no Japanese had been allowed to leave his island home, and no foreigners to land. All who had been cast on shore, had been either killed or imprisoned. Great must be the power wielded by the rulers of this strange country, thus, for two centuries to succeed in preventing the departure of a single Japanese subject! Yet such appears to be the fact, though before this edict, they were enterprising sailors, and if we may believe the records of the period, not only traded with the Indian Archipelago, but even extended their voyages as far as South America.

Thus briefly we have nearly the whole history of early European intercourse with Japan, and two questions press themselves on the attention of all who read. Whence the seemingly sudden and violent change in the policy of the Japanese? And was it sudden in reality or of slow and insidious growth? that only came suddenly on Europeans, because they blinded themselves to the signs of change and indications of danger, otherwise plainly to be discerned, had any one looked with a clear and intelligent eye.

The accounts of the period are full of details of feuds between the different monastic orders; of the pride, avarice, and overbearing arrogance of the priests; the over-reaching and insatiable cupidity of the Portuguese and Spanish merchants, which latter charges are not even limited to the laymen. Yet admitting all these causes to have been in operation, and exercising the influence which belongs to them, it is impossible to doubt that other and more profound causes of distrust and dissatisfaction chiefly moved Taiko-sama (when laying the foundation of his usurped empire) to irreconcilable enmity, directed more especially, if not altogether exclusively, against the *padres* of every order, and their converts. One cause of such enmity lies indeed on the surface.

The great success of the Jesuits and missionaries of various monastic orders, had been based, in part at least, on the shifting sands of political favour and influence of the feudatory princes in their several territories; a turbulent race, as was the same class in the days of the early French and English kings:—not often at peace with each other, and often in league against their suzerain. One of the most obvious conditions of strength to the latter was the abasement and weakening of the nobles. Taiko-sama, in order to strengthen and render hereditary his sovereign power, necessarily therefore set himself to this task, as did Louis XI., and later, Richelieu and Louis XIV. in France.

Whatever was identified with the feudal chiefs would not fail to share the fate of an order doomed to destruction or humiliation. While the Jesuit sought to promote the objects of his mission by

* Commodore Perry enters fully into this sad story, so unfavourable to the Dutch of those days.

favour of princes and court influence, and for a time reaped great fruit therefrom,—these same feudatory princes were looking to force and intrigue to advance their own interests, and uphold their cause against an ambitious and successful general, who had seized the quasi sceptre. That both the princes and their protegees the missionaries, should be involved in a common ruin, was in the nature of things to be expected, and indeed inevitable. If one feudatory prince protected Christianity, it was equally open to his successor to attack and persecute it. The spiritual guide who had "put his trust in princes" and the sword, found all the aid of man impotent to save when the hour of trial and persecution came. They had built on a mundane foundation with the aid of sword and buckler, and by the same was their ruin effected!

But beneath all this lay other causes, wider and more permanent in their influence. Another and far more fatal element of destruction had been slowly but surely preparing the way for the final catastrophe from the beginning, undermining the very ground on which the whole spiritual edifice was built, whether Jesuit or Augustinian, Franciscan or Dominican, Spaniard or Portuguese, fashioned the walls.

The determining cause of the downfall and utter destruction of the Roman church in Japan is to be sought in the pretension to a *spiritual supremacy*, which is but another name for the *monopoly of power* over all mankind, since all that is political or secular must bow to God's vice-regent, on earth, who claims the right to bind and to loosen, to absolve subjects of their oath and fealty, and dethrone kings by his edict! This pretension to *supremacy* and *Papal infallibility*, and to a power as unlimited as it is irresponsible, has been woven into the very texture and fabric of the Church of Rome, and has long been considered inseparable from it.

The Japanese rulers, who during fifty years never relaxed in their policy to extirpate out of the land all trace of the missionaries and their teaching, and were deterred by no difficulties, no sacrifice of life, or commercial advantages, and never stopped until their object was accomplished, clearly saw that between them and such teachers there could be neither peace nor truce. The two systems were necessarily antagonistic and mutually destructive. The Siogun must of course veil his power to the higher pretensions of the Pope and the priests; he must hold it from their hands, liable to be dispossessed at their pleasure,—or be engaged in interminable conflict all the more dangerous, as spiritual weapons would be brought to bear, as well as the arm of flesh by his adversaries of the cowl and rosary. Taiko-sama, a man of no ordinary gifts apparently, who first engaged in a war to the death, and issued the edict of extermination, must indeed have been something more than dull, not to have his doubts raised and his worst conclusions verified by the tenour of the letters to the Pope, given by the three feudal princes who composed the embassy above mentioned.

Here is what they said: thus writes the prince of Bungo:—

"To him, who ought to be adored, and who holds the place of the

King of Heaven, the great and very holy Pope;" in the body of the same letter he continues in the same strain, "Your holiness (who holds the place of God on earth)."

Again, the king of Avrima addresses himself "to the very great and holy lord, whom I adore, because he holds on earth the place of God Himself."

And again, the prince of Omara goes if possible further: he says, "With hands raised towards heaven, and sentiments of profound admiration, I adore the most holy Pope, who holds the place of God on earth."

With what feelings must *Taiko-sama* have spelled over these words of homage to an alien sovereign, by three of the leading feudatory princes of his empire, when the death of Nobunanga in 1582, the sovereign friend of the missionaries, threw the reins of power into his hands? He must indeed have been blind not to have seen whither the church of Rome was tending; and how irreconcilable were its pretensions with his own.

This and no other cause writes our experienced author, led to the final expulsion of every European, the extermination of every Christian convert, and the closing of every Japanese port for two centuries. The annihilation of commerce and material interests was merely a necessary consequence of the close connection that had subsisted between the professors of religion and the traders; taken in connection with their common nationality.

And this, now that the Japanese yielding to the force of nations, and an obvious necessity, have entered into treaties with foreign powers, will undoubtedly sow distrust and misgiving in the minds of Japanese rulers. And how should it be otherwise? The church of Rome has undergone no change, neither have the pretensions to Supreme and undisputed power in the Micado and Tycoon (however shared between them) been modified. Why should we expect the Japanese to change in *their* estimate of the true tendency of the Roman church system and doctrines? The repugnance which the Protestant sovereign feels to hand over for the keeping of a *spiritual confessor* and *director* the consciences of his subjects, and their individual right of judgment, may well be allowed to the rulers of a heathen people in no degree inferior to many European populations in intelligence, wealth, and industry; and far before many, in their long cherished and well-defended national independence.

If these matters regarded only the past they might have been let alone. But they are things which have sprung again into life under recent treaties. Actualities will again and again occur which we must be prepared to meet face to face from day to day, contributing as they will in no slight degree to the difficulties and complications naturally to be anticipated in the renewal of long interrupted relations between two races so entirely distinct as the European and Japanese, and one of these so long in hostile isolation.

One more fact and strange coincidence is worthy of observation. In that same year when the last of the Roman Catholic converts of

the Japanese were buried under the ruins of their captured city of Simabarra, the tomb of Christianity in Japan, or hurled from the rocky islet of Pappenberg, in the bay of Nagasaki, a few exiles landed at Plymouth in the newly discovered continent of America, where they were destined to plant the seeds of a Protestant faith, for a great Protestant country. Thus strangely the very same era which saw thousands of converts to that church, from which the pilgrim fathers had seceded, martyrized, and the Romanist faith trampled out with an unsparing violence on one side of the globe, marked the foundation of a Protestant Church in the other hemisphere, destined rapidly to spread the Gospel over a whole continent. And they were the descendants of these same pilgrim fathers, who two centuries later in the cycle of events were the first among western nations to supply the link of connection wanted,—to bring the lapsed race once more within the circle of Christian communion, and invite them anew to take their place in the family of civilized nations. Such indeed is the effect of Commodore Perry's expedition from the United States of America.

VOYAGE OF H.C.M.S. NARVAEZ

From Manila to China and Japan in 1864.

(Continued from page 257.*)*

WHILE we had been at our anchorage off the Pei-ho the British gun-vessel *Osprey* arrived, having on board Mr. Wade, the Minister to China, to relieve Mr. Bruce. By this arrival we gained some unsatisfactory intelligence concerning Shanghae. The cholera was making great havoc at Shanghae, where one thousand to one thousand five hundred persons were dying daily. One of the English men-of-war there, the *Leopard*, had lost two officers and fifteen men. Among the victims to the epidemic was the Spanish consul, Senor Don Eusabio de Fortung.

Our ship was very badly off for fuel and I did not know where to obtain it. I had intended to get it at Shanghae, but accounts of the place induced me to abandon the plan. In fact I did not think it right to expose the crew of the *Narvaez* to it for the mere purpose of obtaining fuel. Besides the coal at Shanghae from what we had seen of it was all bad as well as dear. I had been detained there a fortnight in the month of May for the purpose of obtaining fuel, and there was no doubt of such being the case now if I had gone, and even a week's stay might produce serious consequences on the crew.

I therefore determined to give up Shanghae and not to go to Nankin river, and it was therefore necessary to look for coal at Pechili. Yet there was none here, or rather what was the same thing, it was about as dear as gold itself. Our minister tried to get me some but failed. The English merchants had no deposits here. The gun vessel at the

Pei-ho used it but could scarcely get ahead with it, in fact we ourselves saw her about seven hours getting through nine miles, and her commander told me it was because he could not get up steam with it. However as there were different opinions concerning it in the *Narvaez*, I determined on trying it. There was a store of it at Taku for which no less than nineteen dollars a ton were demanded, and I obtained a small quantity of it to try the experiment. The result of this experiment was that we could do much better under sail, better at least than in throwing money away on that black rubbish, which would scarcely set the engine in action. I therefore obtained some fresh provisions at Taku, and left the anchorage off the Pei-ho at daylight on the 25th of June for the Philippine islands.

There is a harbour called Yen-tai on the peninsula of Shang-tung at the entrance of the gulf of Pechili, that has been recently opened to European trade in virtue of the late treaty with China. With the view of ascertaining if it was possible to obtain coal there we anchored in that harbour in the evening of the 28th.

Yen-tai is an insignificant village which is daily increasing, on account of the province of Shang-Tung producing cotton, which it exports to Europe. There were twelve merchant vessels of different countries in the harbour and two French gun-boats, besides a large number of Chinese vessels, and notwithstanding the number of Europeans established there being very small, I did find coal there of a very fair quality. We embarked eighty-six tons at seventeen dollars the ton, and after receiving it we sailed at daylight on the 30th.

Notwithstanding this supply of fuel it did not fill our bunkers and I began to think whether it was possible to reach Hong Kong with it without making a tediously long voyage of it. Supposing that I should find variable winds in these latitudes, I banked up the fires and made sail on leaving the port intending to reserve my coal for lower latitudes, when I might meet the S.W. monsoon. But as soon as we had got into the Yellow Sea I found the monsoon already there, according to the directories, and established with tolerable strength, and its alternate gales and calms. Eight days battling with this wind and its calms and showers took us to the Corean archipelago, and we were three days in sight of the Alceste and Modeste islands, tacking without improving our position. It was therefore evident that if we continued under sail we might remain here until the month of November, when we should have cold N.E. winds. It was actually necessary therefore to use my fuel and to replenish it wherever I could do so.

There were two routes open to us,—one to the S.W. to Shang-Tung, to go up the river, paying heavy pilotage dues, and arrive at a town infested with cholera, to lose much time there and to get supplies at a very heavy cost. The other route was to the S.E. to Japan, where an opening was to be found, a healthy country, where as yet our flag was not known, to see a people who were attracting the attention of Europe, where I should lose no time and find all the fuel I wanted.

I was not long in deciding, got steam up on the 7th of July, in the

evening, and shaped the course for Nagasaki: I was quite aware that I might have difficulties to encounter, and acquainted with the history of the country in reference to its affairs from the time of Commodore Perry's expedition to the present. I considered also that I knew something of the causes which had induced the Japanese government to close its ports from the time of Francisco Xavier, as well as those which had occasioned their being open for the last nine years. But if there were difficulties they were surely not to be insuperable. The nationality of the ship was somewhat dispiriting, for perhaps on account of our proceedings in former times, Japan might have adopted the course she had done of excluding all Europeans from her territory excepting the Dutch, which people in recompense for having taken up arms against us were permitted to carry on a limited traffic in the contemptible islet of Decima.

All these oriental cities have very complete historical records, and my doubts lay in the reminiscences which might be awakened by the appearance of our flag. But considering all things, that circumstances might be very much altered by lapse of time, my doubts were not sufficient to induce me to alter my purpose. Besides as on some future day not very far off, it might be necessary to come to Japan in reference to our possession of the Philippine islands, the accidental arrival of this vessel in any Japanese port with the legitimate reason which I had, would at all events avail to take a look at the place and therefore it was as well to take our chance.

We have never had any treaty with Japan, for no other reason than that we were not here when all the other powers of Europe were present, at the time that the Japanese government opened their ports to the whole world. However this absence was no impediment to the proceedings of the *Narvaez*, as a ship of war from her very nature has a right to go everywhere. So once more our steam was at work: on the evening of the 7th our port was in sight, and on the 9th by sunset we anchored at Nagasaki.

On our nearing this harbour it became very evident that Japan is a very different country from China. The entrance of Nagasaki displays batteries of a good order and in good positions, armed with heavy artillery of European make for its defence, and to force it with unarmoured ships would be no easy matter. Before we had gained our anchorage a boat with a Japanese officer boarded us to learn the nation to which the ship belonged, and to make what might be termed a visit of inspection and enquiry. Such a thing is never heard of in Chinese ports where vessels come and go as if they were uninhabited. This Japanese officer knew from our flag the country to which we belonged, and he told us so in very fair English. In China they mostly confound all European vessels with each other, for there they think that they all belong to one nation, which of course is a barbarous one. But how different with the Japanese: they are acquainted with geography, a subject of which the Chinese are absolutely ignorant. The Chinaman holds the arts and sciences of Europe in as much contempt as the Japanese does in admiration. One depreciates them

as contemptible while the other is busy in introducing them into his country.

We anchored at Nagasaki about eight in the evening, and I must say that our arrival did produce some degree of sensation. Soon after we had anchored, the report of six or seven guns were heard, each of which came from a distinct point. We took no notice of them considering they were some evening guns. Besides we had come from China, which is a part of the world where they burn a large amount of powder in salutes, and we had been accustomed to such matters, so it had been forgotten. However on the next day we learned they were signals of alarm, fired from different batteries, and that we ourselves had been the cause of them.

However about ten p.m. a handsome faluca boat came alongside (similar to those used by the Captain of a port), accompanied by various officers and Japanese interpreters. They had come from the governor to salute the ship and to know the object of her visit. Having informed them that we wanted coal, water, and provisions, the conversation was thus opened, in the course of which they placed a paper in my hands of English writing which I was told contained the port regulations for vessels of countries with which they had no treaty.

In fact these orders were entitled "Regulations," which were exceedingly brief, being reduced to two. No. 1, The ship's boats were not to be used for communicating with the shore; No. 2, Everything that was purchased to be passed through the custom house on which the established duties were to be paid.

This second regulation was perfectly natural, and I could have no objection to it; but with respect to the first I requested explanation, for the terms of it appeared to be vaguely expressed and with a certain obscureness, which admitted of a glimpse only of its intention without expressing it categorically. These explanations gave me to understand that there was no objection to the vessel remaining in port as long as desired; but that whenever it was desired to land that a flag should be shewn from the top, that a Japanese government boat should come to us, and as a palliative it was added, that there would be no delay on her account. To have accepted this would have been, seeing that we were to have no communication, to remain when wanting the least thing to complete us, entirely at the good or ill-pleasure of the authorities of Nagasaki. I shewed them briefly but clearly that it was not possible to accept such a condition, giving what appeared to be cogent reasons against it. It was of no use in the Superintendent to quote the names of vessels of other countries that had come there to treat with the Japanese, and that they had conformed with it according to their account. And it was of no use their offering me one of their boats to be in constant attendance on the ship so as to cause no delay by waiting her arrival, I considered this an extraordinary intermeddling with the internal affairs of the ship, and that it was my duty not to admit of any interference with the use of my boats whenever I thought it right to employ them. As we could not agree on this point the superintendent at length said, that he would consult the

governor. But as I suspected that this consultation might become a pretext for delaying us, and would become a point for one of those interminable negociations with which the people of the East treat Europeans, I gave him to understand distinctly that early on the following morning the matter must be settled, as I had business to do on shore, and that should it not be so I should land at the town from my own boat. I therefore returned him the paper of regulations, and he took leave of us at one in the morning, assuring me that on the following morning he would let me have the governor's answer.

In the course of this visit I could not but observe with much satisfaction the very polite bearing of the Japanese officers, so entirely different in their courtesy and dignified conduct from the familiarity and flattery of the Chinese mandarins.

At six in the morning another Japanese faluca came on board bringing the second governor of Nagasaki attended by a larger retinue of officers, and of course their own interpreters.

Following the invariable custom of all the orientals of never going straight to the subject in hand, they began talking to me on various indifferent subjects, of the Philippine Islands, of our government having had no treaty whatever with theirs, and even touched on our late war with Morocco. Presently they touched rather energetically on our object in coming to Japan, whether it was to treat on business (such was the expression used by the interpreters), that is to form treaties, adding that in such case it would not be here but at Yokohama where they would be held. Being easily and readily satisfied on this point they approached the real business before us, although indirectly but in a manner as if it were settled, that whenever I wanted a boat I had only to make the signal above-mentioned.

I waited for this, and when it came attacked it resolutely and point blank. I told them that according to all law the Japanese had the right to admit or not to their ports any vessel whatever. That if she were admitted and that vessel was a ship of war they had also the right to say whereabouts she should be anchored. But having once admitted and allowed her to anchor they had no right whatever to interfere with her internal regulations: that one of the points affecting these was the proper use of her own boats in communicating with the land. I shewed that it was impossible for me to treat on the subject except on either of these conditions, the admission or exclusion of the ship from the port. And I concluded by saying that I had come to Japan resolved not to fail in anything towards the Japanese, and equally resolved not to admit that they should fail in anything towards the Spaniards, that our only way of understanding each other was a mutual respect for the established principles of the rights of the people of all civilized nations.

This was sufficient. My frank and loyal diplomacy, something in the way of a tarpaulin like that of all naval officers, produced the desired result. There was no other point for discussion. The governor explained things fully to me, and said that he considered the matter as settled. And certainly it was so. We remained at Nagasaki in the

same way as we should have done at Manila. I took great care that none of the officers or crew should give the slightest cause for offence to the Japanese, and they on their part did everything in their power to enable us to take away on our sailing a good opinion of them.

A few days afterwards they explained to me why they had desired we should communicate with them by their boats. It appears that some foreign ships of war had introduced opium among them in spite of the prohibition against this article. The Japanese government had taken measures to prevent the repetition of this, and the authorities of Nagasaki were apprehensive that we should do the same. In treating about supplies, the governor told me that the Japanese government would facilitate my obtaining fuel, water, and fresh provisions, but that no salted meat was to be had, for they had it not. I accepted the offer with great pleasure, inasmuch as it was the Japanese government that would supply my wants and not a foreign merchant, in spite of all the offers I had received from a multitude of merchants to supply us from the moment we anchored. But I assured the governor that my acceptance of his offer was on the condition that everything would be paid for, which he agreed to as quite understood. At length everything being thus settled he took leave of me at nine in the morning.

I have mentioned that at Nagasaki we have been treated in the same way as if in any Spanish port. The novelty of finding ourselves in Japan led us on shore (the officers as well as myself) whenever we had got the work of the ship done: and the same permission was given to the crew. From the first the Japanese knew us by our uniform, and paid us marked attention. Nothing whatever in the least unsatisfactory has occurred, notwithstanding we have been in all parts of the city and in the country, and even sometimes the officers and myself have returned on board late at night after being in company with sometimes Europeans and sometimes Japanese. We have been received everywhere with affability, smiling looks, and pleasing attentions. And this at a time when other naval officers have landed with a revolver in their belts; when in a certain squadron stationed at Japan *it is said*, there is a certain order desiring that any Japanese seen to place his hand on either of his swords when passing near a European, should be shot in the act without hesitation. It is very well known that all Japanese (excepting those of the lowest class) never go about except he is armed with two swords, and it is a custom as general as in Europe to go out with gloves or watch. The above order became necessary in consequence of the numerous assassinations of officers and men of the squadron, and is still in force. In fact everyone in the *Narvaez* has been delighted with Japan, and for my part I look back with pleasure on the days I have passed there, for that country is assuredly the best part of Asia.

Certainly our arrival at Japan was at a moment of great exultation as well among Europeans as Japanese. The relation of the Christian powers was not in high estimation in certain parts of their country. They had had recourse to deeds of arms and were in a mind to

continue them. Two important towns, Simonosaki and Kagosima, had been bombarded about three months before, and a new expedition was preparing against the first of these cities. It is easy then to suppose the existence of a latent feeling of hostility in the Japanese mind against Europeans generally, although they were not directing their attentions against the government of the country, but against one of the powerful daimios of the empire, although the result would be war against the Japanese themselves.

It appears that the Japanese have certain business in which we sympathize with them. They all come to us telling us what has happened, relating matters of course as seen from the Japanese point of view. Yet they have never expressed themselves with hatred, but in words of complaint against Europeans, whom they say are not just towards them, attributing to their failing in justice the bad understanding which prevails between the two races. I believe I must be excused for saying that I do not interfere in the business, and that I have said that I consider myself quite incompetent to judge of matters further than in private conferences and communications purely personal.

In my opinion the Japanese would by no means be indisposed to go to war with any European power, notwithstanding he generally admires Europeans and has no objection to them. Although I have been a very little time in Japan, from what I have seen and heard no one seems to know how the Japanese should be treated.

The Fiji Islands.

These beautiful islands are among the most valuable in the broad Pacific. They were thoroughly explored and surveyed by Wilkes, and the description is to be found in volume III. of the United States Exploring Expedition. Since Wilkes' survey, which was more general than for purposes of details, we have profited largely in their hydrography by the visits to the group of the present R. Admiral Sir Henry Denham, when in command of H.M.S. *Herald* on her surveys in the Pacific Ocean. The situation of these islands is very convenient and important. There are many fine harbours, and easy of access, where ships can even now procure fresh provisions and good water in abundance. They are on the highway from China round Cape Horn, or the Cape of Good Hope, for Australia or for South America; while the road to Australia from South America lies close along their western shore.

The present King is Thakombau, about fifty years of age. His Majesty thus writes his name, Cakabau. He is a son of Tanoa, so conspicuous during the visit of Wilkes. The islands are divided into seven districts, each having its chief. Two districts do not acknowledge Cakabau's authority. In May last Cakabau was crowned King

by foreigners and his chiefs, who are loyal. In 1853, Cakabau and his chiefs renounced cannibalism, plurality of wives, the strangling of widows at their husbands' death, and the clubbing and eating of prisoners. These salutary reforms were brought about under the direct influence of the Wesleyan missionaries, who have been labouring there about thirty years. The islanders have advanced to about that state of christianity and civilization that prevailed at the Sandwich Islands thirty years ago.

From Capt. Stanley, commander of the United States steamship *Tuscarora*, we have learned some very interesting facts respecting the present state of affairs at those islands. He was sent thither to settle certain claims due to Americans from the King. The sum total of the claims (varying from one to ten thousand dollars) amounted to 65,000 dollars. Upon examination, these were reduced to 43,564 dollars, with interest at six per cent. Some he found to be exorbitant, and others unfounded.

On his arrival, according to an old precedent acknowledged as sound by king, people, and foreigners, Capt. Stanley, as the commander of a man-of-war, was appealed to, to sit as umpire, or judge, who should settle difficulties between natives and Americans. According to previously decided cases, his decisions must be final, and without appeal.

Acting in this capacity, he adjudicated in many cases brought before him. In one case, for example, an American brought a case against natives for stealing. The case having been heard, he decided that the natives should restore what was stolen, or its value. This was done. When the criminals (there were three of them) were arraigned for sentence, each one was brought in separately and asked what punishment should be given them. One said, "that he should be flogged, but not as much as the others, because he was the oldest of the three. He had lived an honest man, and correction was not so necessary for an old man as for a young man." Another said, "that he ought to be flogged, but not so much as the others, for he was the youngest, and the custom of Fiji was for young people to be ruled by the old people. He only did what the old man told him." The other said, "he ought to be flogged, but not as much as the other two, for they had rank, and he was only a poor slave." This was a case of special pleading worthy of a Philadelphia lawyer. They were willing to make restitution. Shortly after the natives in turn brought up this same American for whipping a petty chief, who would not work according to agreement. So aggravated were the facts, that the American was fined seven hundred and fifty dollars, or one-half of his entire property. In one case the King demurred about carrying out a certain decision, which would put a foreigner in possession of a small island. He was told by Captain Stanley that he had power on board his ship to enforce the decision. His Majesty had the good sense to execute the law, or enforce the decision.

So much did Captain Stanley's decisions meet the views of the King and people, that he was made umpire between other foreigners and

the native government and people. King Thakombau has gone so far in admitting foreigners to influence him in his government, that a written constitution has been published. It contained an article in favour of slavery, which Captain Stanley persuaded them to erase. Captain Stanley, originating from North Carolina, and remaining loyal during the late war, was urgent and bold in his opposition to the principle of slavery among the Fijians. The constitution goes into effect in January next, when every male inhabitant, eighteen years old and upwards, must pay an annual tax of five dollars.

The American Consul at Fiji is Dr. Bower, who figured in Mexico during the Mexican war, while the British Consul, Captain Jones, for eminent services during the Crimean war, was promoted from the ranks. These are the only Consuls officiating there.

Captain Stanley speaks favourably of the English Wesleyan missionaries labouring among the people. About one hundred Americans have settled on the islands, and about three hundred foreigners of other nationalities. The islands are favourable for the growth of cotton (Sea Island), sugar and cocoanut oil. Lands are rapidly passing into the hands of foreigners. Deeds registered at either of the Consulates are acknowledged good. All land purchases pay ¼ per cent. for registering title at the office of the Secretary of Foreign Affairs, by the constitution which goes into effect on the first of January next. A gentleman from the State of New York, by the name of St. Johns, acts as His Majesty's Minister of Foreign Affairs. The King finds it best to act as his own Minister of Finance. He is not particular to report to his chiefs and people the state of his finances. Bau is the capital. Levuka, island of Ovalau, is the port where the Consuls reside, and where ships discharge and receive cargoes. The rumour is rife at the islands that some years ago, when the question of the sovereignty of the islands was about to pass over to England, negociations were stopped in consequence of the Wesleyan Missionary Society's strong opposition to an English Colonial Bishopric. The Wesleyans believed in kings, but not in bishops of the English Church.

Captain Stanley asserts that the only disturbing element at Fiji is an unhappy war, now carried on by the King of Tonga, King George, in which he is striving to conquer the Fijis, wholly or in part. He does not hesitate to say that in his opinion, the missionaries favour King George's scheme of conquest. The influence of the Wesleyans is all-powerful at the Tonga islands, having King George at their head. In Captain Stanley's opinion, the influence of the Catholic missionaries at both of those groups is very weak, and possesses but little effect.

The Fijis are located between South latitudes 15° 30′ and 19° 30′, and West longitude 177° and 178°. The group comprises one hundred and fifty-four islands, sixty-five of which are inhabited. The total population is about 130,000. The largest island, Vitilevu, is well adapted to grazing, and is covered with most beautiful pasture lands, particularly suited to sheep. Foreigners are rapidly locating there,

mostly Englishmen from Sydney, and a few months ago, a tract of land was purchased for a sheep ranch, for which £30,000 was paid. For another £15,000. Captain Stanley thinks that in a few years the group will virtually belong to the British Government, as it will become to all intents an English colony, the same as New Zealand.

On the largest island is a deep river, up which the officers went in boats about forty miles, and could the *Tuscarora* have crossed the bar she might have steamed up twenty or thirty miles The banks of this stream are said to be charming, and must one day become densely populated, as there is room for extensive agricultural and grazing enterprises. Samples of long stapled Sea Island cotton were shown us, which measures fully *two inches in length*, and of wonderful fineness —surpassing the best Hawaiian or Carolina that we have ever examined. As yet but little attention is paid to agriculture. Grazing is the chief attraction.

The proximity of the group to Sydney and Tahiti, eight or ten days' sail from either port, is attracting many settlers. These are mostly adventurers without means, who cause much trouble with the natives and among themselves. During the rebellion, these Sydney adventurers persuaded the chiefs that the American Government was broken up, and that they would never see an American war ship there again. The effect was, that Americans were maltreated in many instances, and despoiled of their property. The visit of the *Tuscarora* has done good, in satisfying the natives that the Government still exists, and will hold them to accountability. It left a good impression on all, foreigners as well as natives.

Three islands have been ceded to the American Government as security for the payment of the claims adjudged to be due, but the chiefs will be allowed their own time to pay them. The Fiji group is literally filled with excellent harbours, making quite a contrast to our own group. These will in time become the centres of industrious settlements.

Captain Stanley found Wilkes' observations very accurate. In every instance that he noticed, there was no exception to be taken. Any vessel can follow Wilkes' surveys or directions with perfect safety. This is creditable to that navigator.

Here is another instance of the benefit of having war ships cruising through this ocean. The *Tuscarora* has visited but two groups, the Society and Fiji, but she or other vessels ought to be kept cruising among these Pacific groups, visiting all the islands possible. There's nothing like a war ship to satisfy a half civilized people of the power of a nation, or to command its respect and good will.

The following curious specimens of Pacific Ocean gossip appear in the same paper in which the foregoing is found, but of a few days previous date. Thus British Columbia, the West India Islands of course, Panama Bay! and the Fijis are to be disposed of.

"The telegrams received by the last mail appear to confirm the

rumours long current that the settlement of the *Alabama* claims is based on the cession of British Columbia to the United States. Of all the annexation projects yet mooted, this appears to be the most plausible and rational. If it is an incubus to the mother country, as the Victoria papers state it to be, its cession will be only a question of time."

Respecting the purchase of the three Danish West India Islands, the *Union* says:

"If the telegraphic reports from Europe are correct, Secretary Seward's thirst for territorial acquisition is in a fair way to be somewhat slaked by the purchase of the Danish possessions in the West Indies. It is said that the Islands of St. Thomas, St. Croix, and St. John, are to be sold to the United States for eight millions in gold, which may be considered a reasonable price for so many Saints in one lump. The Danish Government possesses the three islands above named and several islets of lesser extent, the whole being comprised in the group known as the Virgin Islands, discovered by Columbus on his second voyage, in 1494. Of these St. Thomas is the largest island, having an area of about forty-five square miles. The surface of the island is rugged, sandy, and unproductive, though considerable crops of sugar are raised. The principal exports of the islands are sugar, molasses, rum, cotton, turmeric, tobacco, and pimento. The harbour of St. Thomas is an excellent one, and the town is a depot of trade for a large portion of the circumjacent islands. The chief value of the proposed acquisition would be found in the facilities for establishing a coaling and naval station for the United States' vessels at St. Thomas. The Southampton steamers touch here, and the present trade with Europe would probably be largely diverted to our own ports eventually."

The San Francisco *Times* hints to still another annexation scheme in the following:

"If we are to credit the telegraphic dispatches, Seward's pet project of the purchase of the Bay of Panama for a naval station will probably be successful. Negotiations for the purchase have been on foot for a long time."

We see no reference to the above in the telegraph dispatches, and it may be a mistake. One would think that the above projects were sufficient to satisfy the ambition of any prime minister, unless it be with them as with rich men, "the more they get the more they want."

It is rumoured that the King of the Fijis has ceded to the United States three small islands of the group, one of which is possessed of a fine capacious harbour capable of being fortified. The cession is understood to be conditional and in the nature of security for the payment of a claim due to citizens of the Republic. The protectorate of that group is also said to have been offered to the United States, through the commander of the *Tuscarora*, but declined by him.

Mouth of the Hooghly.

Pilot Vessels—Signals:—Errors in Sailing Directions.

Sir,—As some of the latest editions of Sailing Directions for the Bay of Bengal are in error in some of the more minute details of the routine of the Pilot vessels at the entrance of the Hooghly, perhaps you will kindly afford space for a few plain directions which may at least prove serviceable to those coming to the Sandheads in command for the first time.

From the 15th of March to the 15th of September, a Light-vessel is placed on the Pilot's Ridge in twenty-one and a half fathoms, thirty-two miles S.W. by W. ½ W. of the Eastern Channel Light, in lat. 20° 49′ N., and lon. 87° 42′ E. This vessel shows a bright light at the mast-head all night, burns a blue light every hour, and a maroon every intervening half hour, from Sunset to Sunrise.

The Eastern Channel Light-vessel is placed in nine fathoms, to the Eastward of the tail of the Eastern Sea Reef, in lat. 21° 4′ N., and lon. 81° 14′ E. From the 15th of March to the 15th of September, besides the usual mast-head light, this vessel burns a blue light *every half hour*, and shows a maroon at the *intervening quarters*, but during the other six months of the year, viz.:—from the 15th of September to the 15th of March, the blue light is only burnt every hour, and the maroon shewn every intervening half hour, and the Pilot's Ridge Light-vessel is removed.

The Mutlah Light-vessel is about thirty-two miles East by North of the Eastern Channel Light-vessel, in eight fathoms. She shows a bright mast-head light all night, and fires a rocket every four hours, but burns no blue lights or maroons. *No guns are fired* at certain intervals by either the Light-ships or Pilot-vessels, as stated in a late book of instructions which recently came under my notice. Guns are fired only to bring vessels to when running into danger, or to attract attention to signals.

During the S.W. monsoon, the supplying Pilot-vessel generally cruises on the Pilot's Ridge in the vicinity of the Light-ship, and the taking out vessel to the Southward of the Eastern Channel Light. In the N.E. monsoon they are usually about a mile or two to the Northward of the Eastern Channel Light-vessel. The supplying vessel hoists a red flag at the main, and the taking out vessel a white flag at the fore. In fine weather the pilots are allowed to board vessels night or day, but when the weather is rough or unsettled (unless the ship is in distress), the pilots are not allowed to board vessels at night.

Calcutta, 11th April, 1868.

Yours respectfully,
L.

To the Editor of the Nautical Magazine.

[Our correspondent has rendered good service to navigators by pointing out these erroneous statements. He would have done right to have named the book.]

The attempt on the Life of the Duke of Edinburgh.

The late Fenian attempt on the life of the Duke of Edinburgh so providentially averted is a matter that belongs to history. By the conductor of this journal it was looked upon with those feelings of disgust and reprobation that was generally felt throughout the land, for reasons too evident to point out. And as a full and authoritative account of it is now before the world, we preserve it entire in these pages, since it not only belongs to history, but the Duke being also in command of one of her Majesty's ships, it is also a subject especially nautical, besides which many of our readers afloat may not have the opportunity of seeing this account and to whom it will be matter of the highest interest. It runs as follows:

The following despatch was received and forwarded to us by the Secretary of State for the Colonies:

The Earl of Belmore to the Duke of Buckingham and Chandos.

Government House, Sydney, March 27th.

My Lord Duke,—It is my painful duty to inform your grace that a most determined attempt was made on Thursday, the 12th of March, to assassinate his Royal Highness the Duke of Edinburgh by a person named O'Farrell, who, I believe, has for some time past, and until six or seven months ago, been residing in the colony of Victoria.

His royal highness on that day honoured with his presence a public picnic, which took place at Clontarf, on the shore of what is known as Middle Harbour, in Port Jackson.

This fête was given in aid of the fund of an excellent institution called the Sailors' Home, and admission to it was by tickets costing £1 and 10s. respectively for gentlemen and ladies. About 1,500 persons were present, having been conveyed there from Sydney and the neighbourhood by water.

It had been once postponed on account of the inclemency of the weather, and the day fixed for holding it twice altered so as not to interfere with the religious observances, first of the Jews and afterwards of the Roman catholics, members of both communities being expected to attend in large numbers.

His royal highness, attended by Lieutenant Haig, R.E., and the Hon. Eliot Yorke, and accompanied by myself, and also by Lord Newry, Commander and Mrs. Rowley Lambert, Commander Campbell, R.N., and by the members of my family and staff, arrived at Clontarf at about from ten minutes to a quarter-past two p.m., in the steamer *Fairy*, which has been placed by its owner at the disposal of his royal highness during his stay here.

On landing we were met by the President, Sir William Manning, Q.C., by the Chief Justice, Sir Alfred Stephen, C.B., and by other members of the committee, and immediately proceeded to the luncheon tent.

After luncheon, which lasted rather more than half an hour, Sir W. Manning proposed "The Health of her Majesty," which was enthusiastically received. Immediately afterwards his royal highness quitted the luncheon tent, and, giving his arm to Lady Belmore, proceeded to another, placed at a short distance, followed by our party and by a few other ladies and gentlemen.

These tents were placed on a sort of flat plain of limited extent, having steep rocks as a background and the sea on its other sides. Behind the tents and to one side of them the ground was rough and wild, but before them there was an open level space of a few acres in extent, rather sandy in most places, but covered with short grass. Between this and the shore there is a thin fringe of gum trees. A considerable number of persons were walking about in this open space, and a corroboree by some three hundred aborigines had been arranged to come off on the ground during the afternoon. After leaving the ground, which his royal highness proposed to do at an early hour, he would probably have proceeded to explore the inlets further up Middle Harbour, and then have returned to Sydney.

As soon as the ladies had arrived at the tent I have before alluded to, his royal highness called Sir William Manning and walked away in conversation with him across the open space. As he had previously told me that it was his intention to hand Sir W. Manning, as president of the committee, a check in aid of the funds of the institution, I naturally concluded that he was about to do so then—which indeed was the case. I did not, therefore, pay particular attention to the movements of his royal highness, but walked slowly in the same direction, engaged in conversation with the Lord Chief Justice, for about sixty or eighty yards, when I believe I stopped and turned round towards the tent. Almost immediately I heard a cry from the other side of the clear space near the belt of gum trees, and on turning round saw a rush of people. I had heard no shots, and it at once occurred to me either that some game or the corroboree was about to begin. Some one near me said, "The duke is shot," and another person, "He is shot and has fallen down dead." Just then some one I knew—I think Sir W. Manning himself—came up to me and repeated that the duke was shot. I had not gone many yards when I met a number of persons carrying his royal highness between them towards the tent. I immediately saw that he was not killed, and the expression of his face struck me at once as not being that of a person mortally wounded. I turned to precede him to the tent, and meeting Captain Lyons, R.N., of her Majesty's ship *Charybdis*, asked him to go and get the ladies out of it. He hurried off at once, and by the time I reached it only two or three were remaining in it, strangers to me, whom I immediately ordered out, and I endeavoured to arrange some cushions to place the duke on, which was scarcely done before his royal highness was brought in.

The first thing I recollect the duke saying was, "Give me air." The side of the tent was pulled up, and I took off his neckcloth and opened his shirt and under waistcoat. Mr. Eliot Yorke took from him

at the same time several articles of value, such as his watch, etc., which he was wearing, his royal highness displaying meanwhile great self-possession.

Dr. Watson, surgeon of her Majesty's ship *Challenger*, was among the persons who carried his royal highness to the tent, and Dr. Powell, assistant-surgeon of her Majesty's ship *Galatea*, and several medical gentlemen who were among the company on the ground were almost immediately in attendance, one of whom, Dr. Wright, fortunately had his instrument case with him.

On his royal highness's dress being removed, the bullet was found to have entered half an inch from the spine, between the ninth and tenth ribs, taking an oblique direction, and was found to lodge about five inches from the umbilicus, and four inches and a quarter beneath the right nipple, having in its course traversed a distance of twelve and a half inches. The shock was very considerable, and it was thought advisable not to remove the ball at the time.

My aide-de-camp, Captain Beresford, started off in the *Fairy* to secure the attendance of Dr. Young (surgeon of her Majesty's ship *Galatea*) at Government house by the time the duke might arrive. Lady Belmore and the ladies of the parties, accompanied by Lieutenant Fitz-George, R.N., followed after a little time, a message being sent by Mr. Fitz-George to the commanding officer of the *Galatea* to have the boats in readiness on our arrival. Lady Belmore was just able to get the needful preparations made in a room on the ground floor at Government-house before we arrived.

We were fortunately able to avail ourselves of the services of two of the trained nurses, selected by Miss Florence Nightingale for the Sydney Infirmary, and who had only arrived in the ship *Dunbar Castle* the week before, under the superintendence of Miss Young.

So far I have informed your grace with some minuteness of what occurred on this occasion within my own knowledge and observation. A very full, and, on the whole, correct account of the outrage itself, and of the subsequent arrest of the prisoner, was published the next (Friday) morning in the Sydney *Morning Herald* newspaper, which I have abstracted, with some trifling corrections and amplifications with red ink in the margin.

From this your grace will learn that O'Farrell came behind his royal highness (who, in common with several other naval officers, wore a uniform frock coat and white trousers) while walking with Sir William Manning, and deliberately shot him in the back with a revolver, being at a distance from him at the time of from four to six feet. He then covered with his pistol Sir William Manning, who had turned round towards him, but providentially this barrel missed fire. O'Farrell has since stated that this second shot was also intended for the Duke. He raised the pistol a third time, intending, he says, to shoot himself. At this moment Mr. Vial, coachbuilder in this city, jumped upon his back and forced his hand down. The result was that the ball struck a gentleman (Mr. Thorne) who was running towards his royal highness, passing through his trousers, the elastic of his boot, and his sock, and

entering the foot a little in front of and below the inner ankle, passing in a direction downwards and outwards deep into the arch of the foot, and lodging in the heel bone, near its articulation with the cubord bone. The ball was firmly embedded in the bone. It was extracted on Saturday, the 14th, and Mr. Thorne is going on well.

O'Farrell was then seized by several persons and taken into custody by Mr. Superintendent Orridge. A determined effort was made by the bystanders to "Lynch" him, and I am afraid that, but for the exertions of the Chief Justice, Lord Newry, and the men composing the band of her Majesty's 50th Regiment, he would probably not have left the ground alive, as the police would have been overpowered.

He was got on board a steamer (which was close at hand) in about ten minutes, and a disposition being shown by the people on shore to again try and get possession of him, orders were given for the steamer to proceed at once to Sydney.

I enclose an extract from the *Empire* newspaper, which describes what took place in some detail.

On arriving at Sydney the prisoner was conveyed to the government gaol at Darlinghurst, and was brought up on Friday morning, the 13th of March, for examination in the Debtors' prison before the acting water police magistrate. The examination was continued on Monday, the 16th, and, at its close, he was committed for trial at Darlinghurst on the 26th instant, that day having been fixed by a rule of court on the application, I believe, of the Attorney-General.

I enclose a copy of the evidence taken at the inquiry before the magistrate.

On Saturday morning, the 14th instant, the shock having disappeared, the bullet was extracted with facility from his royal highness by Dr. Young, surgeon of her Majesty's ship *Galatea*, and Dr. Watson, of her Majesty's ship *Challenger*. Since that time no unfavourable symptons have occurred, and his royal highness continues to progress as favourably as could be wished. There are no symptoms of any injury to the lungs.

I have only to add that the prisoner was arraigned yesterday before the Supreme Court. He pleaded "Not Guilty." On the application of counsel for the defence the trial was postponed until Monday next, to enable them to endeavour to procure further evidence with regard to the prisoner's antecedents. Although the prisoner has avowed himself to be a Fenian, his family have undertaken his defence on the ground of insanity.—I have, etc., BELMORE.

His Grace the Duke of Buckingham and Chandos.

We regret to learn from the Australian newspapers that the authority for the statement that O'Farrell was the agent of others in shooting the Duke of Edinburgh is the assassin's own declaration. In the report of his examination before the magistrates the following passage occurs:

The whole of the depositions having been read by Mr. Lees,

Mr. Voss called upon prisoner to stand up, and then asked him if

he had anything to say, at the same time administering the usual caution before committals.

Prisoner—I have nothing to say but that the task of executing the Duke was sent out and allotted to me.

The Crown Solicitor—Will you repeat what you have just said?

Prisoner—The task of executing the Prince was sent out to me, but I failed, and I am not very sorry that I did fail. That is all I have to say.

Of course, no unconfirmed statement of a man in O'Farrell's position ought to be accepted as conclusive evidence against third parties; but, on the other hand, the prisoner, who does not appear to have shown any strong disposition to exculpate himself, knows better than any one else whether he had accomplices. The man's fiendish tenacity of purpose is shown very strongly in the Earl of Belmore's report. After bringing the Duke to the ground with his first shot he deliberately aimed at him again, and fired, intending, as he afterwards admitted, to make sure of his victim. The same untamed ferocity characterised his demeanour under arrest. To the police, when taken, he said, "I am sorry I missed my aim. I'm a Fenian. God save Ireland!" And under examination before the magistrate he said, "If he (Sir William Manning) had not come forward I would have shot the Duke a second time." The prisoner was well defended by Mr. Aspinall, and had a fair trial. It appeared from the evidence of witnesses for the defence that he had had epileptic fits, and had suffered from delirium tremens, but testimony proving his alleged insanity was not forthcoming. The slowness which often attends the collection and preparation of evidence against great criminals sometimes leads very sensible persons to look with favour on those methods of summary popular justice which are occasionally reported from the far west of America. If ever there was a case for Lynch law this murderous attack upon the Duke of Edinburgh was one. The crime was of a turpitude that could not be surpassed, it was open, having been committed in the presence of hundreds of people; and the identity of its perpetrator was as certain as anything could be. And yet, in their eagerness to Lynch the murderer, the crowd nearly killed one innocent man, and severely injured another. The Duke's life was saved by a gentleman named Vial, who sprang on O'Farrell's shoulders and felled him down just as he was firing a shot. The Sydney *Morning Herald* thus reports what next happened:—

"The scene which followed almost defies description. No sooner had Mr. Vial grasped the man who had fired the shots than several other gentlemen also seized him; and, had it not been for the closing in around them of the police and other persons, they would speedily have placed him beyond the reach of the law courts. The people shouted "Lynch him," "hang him," "string him up," and so on, and there was a general rush to get at him. Unfortunately for Mr. Vial some of the people mistook him for the Prince's dastardly assailant, and for a few seconds he was treated unmercifully. He was pulled backwards by the hair of his head—he was kicked and beaten, and his hair and

whiskers torn out by the handful—and it was not until some gentleman who knew Mr. Vial came to his assistance that he was released.

All the circumstances here were most favourable to Lynch law, and yet the attempt to resort to it was very near causing the death of the very gentleman whose prompt courage saved the Prince.

The Japanese and their Dealings with Europeans.

Events in Japan seem to claim a fearful precedence in notoriety next to that barbarous Fenian occurrence at Sydney, to which we have alluded in another page. A resort to that too handy weapon, the sword, has again brought down on these people the punishment which they must have known would eventually overtake them. The murder of a boat's crew of the French man-of-war *Dupleix* is thus related, in a letter, dated Hiogo, 11th March :—

You will be very sorry to learn that a fearful tragedy has been enacted six miles from Osaka, in the bay. A boat's crew from the *Dupleix* was sent to wait for the French consul and the captain, who were expected overland, but they were stopped by some fellows and told they could not pass, so rather than run any risk they turned back. In the meantime the boat had been waiting for them some two hours, and the men were lounging about on the beach unarmed, when all of a sudden some Japanese (about two hundred in number) opened fire on them, shot them down as you would shoot pigeons, killing several, and taking the wounded prisoners and putting them to death.

The French authorities recovered eleven bodies, and I attended the funeral of the poor fellows this afternoon. The midshipman, who was killed, was the only one who had a revolver, and he fired off all the barrels before he was killed. All the ministers and residents, etc., attended the funeral, also officers from the different men-of-war, and the band of the *Ocean*. The captain of the *Dupleix* made an oration over the poor fellows' graves (there was no priest); he was very much excited, and told the Frenchmen to look on the graves of their shipmates and countrymen who had been foully assassinated, murdered in cold blood, that their deaths must be revenged, or they were all cowards and not Frenchmen. The minister, Léon Roche, spoke next; he was so cut up that he could hardly speak, and the tears choked him, in fact all the sailors present were shedding tears. He told them to have confidence in their officers and minister, and he solemnly swore over the bodies of his murdered countrymen, in the name of France and the emperor, that they should be bitterly revenged. It was a most sad scene, and even the most thoughtless were much affected. There are several more men severely wounded, and I think, two officers, who happened to be near in another boat. The Japanese authorities admit themselves that it was a cold-blooded murder, and

that there was no excuse or provocation for it. They offer to make all amends in their power. All seems quiet again now at Hiogo.

The *Japan Herald* gives the following as the funeral oration, preached by M. Léon Roche, the French diplomatic agent, over the graves of the sailors so cruelly murdered at Sakai (Japan):—"My brave lads,—You have been murdered in the most cowardly fashion, without giving any provocation, and while in the execution of your duty. If your noble officers had acted on the spur of the moment, you would have been avenged by the destruction of a city, and the death of thousands of inhabitants. They had the rare courage to repress this first desire, feeling that France should reply to barbarism by civilisation. But, because it is delayed, the reparation will only be the more striking and the more just. I swear to you, in the name of France, and of the emperor, whose noble sons you were, that your death shall be avenged in such a manner that your comrades and fellow-countrymen shall not be exposed to atrocities like those of which you fell the innocent victims. You are with God, pray Him to aid us in our painful task."

The consequences and result are found in the following extracts from the *Moniteur*:—

Our latest correspondence from Japan bears the date of the 11th March, and contains interesting information upon the deplorable events of Sakai. The representatives of the foreign powers, after having obtained satisfaction for the attempt of the 4th February, had been assembled for some few days at Osaka to hoist their flags again, and enter into relations with the new Japanese government, when the fatal news of the massacre of ten French sailors of the *Duplaix*, assassinated on the 8th of March at Sakai, came to their knowledge. The same night, the 8th, the ministers of England, Prussia, Holland, Italy, and the United States of America met at the house of the minister of France, in order to establish a common understanding upon a matter of which all foreigners were concerned; they resolved to leave Osaka, to haul down their flags, and withdraw their respective consuls until complete satisfaction had been accorded. The next day the Japanese authorities came and announced that the bodies had been found, and were about to be given up. They declared that our sailors were free from all blame, that the massacre was without excuse, and that a striking punishment was necessary. The murderers—brought from Sakai to Osaka—were placed at the disposition of the minister of France. The solemn interment of the victims took place on the 11th March at Hiogo, in the presence of the Japanese functionaries and of the English and French sailors. All the representatives of the powers were present at this sad ceremony. Ultimately M. Léon Roche, after concerting with his colleagues, whose co-operation never failed him in any of the phases of his mournful mission, addressed a claim for compensation to the Japanese government, which all the ministers of the other powers supported by energetic notes, manifesting horror of the crime committed, and showing the solidarity which unites all nations in presence of the offence committed against one of them.

The *Moniteur* of 18th May publishes the following news from Japan under date of the 26th of March, as the result :—

Every satisfaction demanded for the massacre of the French sailors at Osaka has been given. The demands made by the French minister were the condemnation to death of twenty officers, non-commissioned officers, and privates who had ordered or executed the massacre, the payment of an indemnity of 150,000 piastres to the families of the victims, and the presentation of apologies by the representatives of the Mikado and Prince Tosa. Eleven of the culprits were executed on the 16th of March. Captain Du Petit Thouars then stopped the execution of the nine others, declaring that sufficient satisfaction had been given. The French minister has gone to Kioto by invitation, where he was received by the Mikado. The English minister accompanied him.

As an appendage to the foregoing we add another extract of Japanese proceedings, and in comparison with it cannot look on it in the same light. Were justice really done here the offending party would appear to be the foreigners :—

An "authentic account" of an execution in Japan appears in the *Owl*, and has been copied into other papers. It appears that some time ago a French soldier committed the wanton offence of breaking through a procession of Prince Bizen and his retainers, and the result was that he was wounded. The French minister insisted upon redress; and the Japanese government, feeling, no doubt, that they were powerless to resist, delivered up the officer in command of the party, whose rank was that of a colonel in the army. The honour of the French nation had been wounded in the person of a drunken soldier, and blood alone could wipe away the stain. The execution took place in a temple in Hiogo, and the company on the occasion was a very select one, composed of Japanese nobles equal in rank to the victim, and of one member of each foreign legation. The offending officer bore himself bravely; he declared that he felt himself innocent, and had only done what the laws of his country, his own sense of honour, and his duty to his prince required of him. He might have added, he had only done what a French colonel would assuredly have done to a Japanese who should have wantonly broken the ranks of a regiment in the streets of Paris. Having made this statement, he plunged his knife into his body, and at the same moment his friend decapitated him. The head was placed in a lacquer basin, and handed round to the representatives of European civilisation, with the pertinent question whether they were now "satisfied." Much sympathy, it is added, was felt for the victim of French susceptibility—who was, we are told, thoroughly ignorant of the rights and privileges of foreigners in Japan, and who suffered death without having inflicted it, for the French soldier survived his injuries. Our readers may remember an English subject, Mr. Meagher, being cut down under similar but far less excuseable circumstances, in the streets of Vienna, by an Austrian subaltern. Our demands for reparation were met by the assurance

that the officer had only done his duty. It might be worth while to inquire whether the British Legation was represented at this disgraceful exhibition in Hiogo. Since then it appears that a whole French boat's crew has been massacred by a party of Japanese, and Sir Harry Parkes was, it is reported, attacked on his way from a visit to the Mikado. Of course there will be more reprisals on the part of the Europeans—consuls will again and again combine and strike their flags, and by "vigorous notes" exact vengeance and blood-money; but we shall not thus inspire the Japanese with respect for the character of Western civilisation. We only hope that it may turn out that Englishmen took no part in playing the bully on this occasion, and in lending official sanction to the disgusting exhibition referred to. —*Examiner.*

THE VOLCANO OF OWHYHEE.

THAT stupendous island mountain volcano named as above by our circumnavigator Cook, and afterwards written by our French neighbours Hawaii, has shown some unexpected activity in the month of April last. So remarkable a sea scene is presented by it,—one which the seaman has so frequently before him that we considered it as being within our legitimate domain. And accordingly our last year's volume abounds with information concerning its convulsive throes, or in other words, has a fair history of the several occasions on which it has been active within the last century. These are, moreover, accompanied by a plan shewing the course of the lava flow in 1859, as well as a spirited view of the crater on that occasion.

It is to be regretted that as our plan shews the whole island the scale is too limited to shew the position of places mentioned in the present account. Still it may be taken for granted that they all are situated on the Kona or *Western* shore of the island. We shall, no doubt, shortly be in a position to say more of this phenomenon so interesting, especially to our own readers, and must be content for the present with the following from the *Daily News*. Severe as was the outbreak in 1859, that of the early days of April last, seems even to have been more so: for the sea, which seems to have been greatly affected by the opening of its bed, has been violently agitated, and in consequence its waves have rushed far higher than their usual limits, and spread destruction where it was little expected. Indeed, so entirely unexpected has been the whole event, that considerable loss of life has been the first result. The next must be to repair the ravages occasioned by the whole phenomenon.

The account before us says:—During the first twelve days of April, which is the day of the advices sent from Honolulu, there had been, it is said, no less than 2,000 shocks of earthquake, followed by fearful

tidal waves, which destroyed whole villages and caused the death of a hundred persons. The volcano from which this eruption took place is the well-known Mauna Loa, which has an elevation of 13,758 feet. At Waischina the earth opened in many places, and a tidal wave sixty feet high rose over the tops of the cocoa trees a quarter of a mile inland, sweeping human beings, houses, and everything moveable before it. A terrible shock prostrated churches and houses, and in addition to the destruction of human life, a thousand horses and cattle were sacrificed.

The first stream of lava broke out from Mauna Loa, some two miles above the residence of Captain Robert Brown, and flowed directly towards it. It came down the mountain side in a broad stream, several feet in depth, and travelled with such rapidity that the family in the house had barely time to escape, taking away with them nothing but their clothes. The path which they took was perfectly free from lava; but ten minutes after they had left it and reached a point of safety the entire road was covered with the fiery stream. The craters vomited fire, rock, and lava, and a river of red hot lava, five or six miles long, flowed to the sea at the rate of ten miles per hour, destroying everything before it, and forming an island in the sea. A new crater two miles wide opened, and threw rocks and streams of fire a thousand feet into the air, and from it streams of lava rolled to the sea. At one time the illumination was visible at night fifty miles distant. The lava has pushed out from the shore one mile. At Waischina, three miles from the shore, a conical island rose suddenly, emitting a column of steam and smoke, while the Kona packet was passing, spattering mud on the vessel. The greatest shock occurred on April 2nd, a great shower of ashes and pumice. During the great shock the swinging motion of the earth was dreadful, so violent that no person could stand. In the midst of this tremendous shock an eruption of red earth poured down the mountain, rushing across the plain three miles in three minutes, and then ceased. Then came the great tidal wave, and then the streams of lava. The villages on the shore were all destroyed by this wave. The earth opened under the sea, and reddened the water. The earth eruption swallowed thirty persons, and the sea many more. Dreadful suffering and terror prevailed in the district, and the whole region was affected.

The entire section of country around Mauna Loa has been desolated. A stream of lava flowed under the ground six miles from the sea, and broke out in four places, each throwing up brilliant jets of fire. The base of the volcano is about thirty miles in circumference, and presented a most barren and desolate aspect, the gases arising from the rent earth having completely destroyed all vegetation. The earthquake shocks were felt in all of the Sandwich Islands, but only around Mauna Loa was the effect disastrous.

When this intelligence left Honolulu the opinion prevailed that the eruption had passed through its most violent and dangerous period; but the discharge of lava and fragments of rock continued, and the spectacle was wildly grand.

A correspondent, writing from Honolulu, says:—For fifteen days the district Kona has been the centre of motion for the great eruption. A gigantic stream of molten lava is flowing from the summit of Mauna Loa across the lands of Kakuka and Poakini to the sea at Kaaluala landing. The slope and part of the summit of a mountain fifteen hundred feet high have been lifted up bodily by the earthquake and thrown over the tops of trees for a distance of over one thousand feet. At Wahoinee a creek has opened, extending from the sea. To as high as the eye can reach on the slope of Mauna Loa the lava is from one to seven feet in width, and an eruption of moist clay was thrown from the side of the mountain between Lyman's and Richardson's, a distance of two miles and three quarters, with a width of one mile, in the short space of three minutes. A column of smoke seven and four-fifths miles in altitude was thrown out of Mauna Loa, obscuring everything for miles around, save where the bright spiral pillars of the fire flashed upwards from the mouth of the volcano. The sight was one of the grandest but most appalling ever witnessed, and almost defies description. The entire topographical appearance of the country has been so completely changed that even those who have lived in the desolated district all their lives cannot recognise it or point out localities with which they were formerly familiar. Luckily, this part of the island is but sparsely populated, and the lands are not in general cultivation. The loss of life, as far as can be ascertained, is as follows:—In the village of Palinka, 33; at Mokaka, 13; at Pulalua, 4; at Honah, 27; at Vanilo, 3. This makes a total of eighty persons killed as reported up to the present time. There are rumours about that the casualties considerably exceed one hundred, but nothing definite on this matter has been received. All of the unfortunate persons who have lost their lives were native Hawaiians, not a white person being killed or in any way injured. Expeditions are being fitted out here to relieve the distressed.

Commenting on the news, the *New York Herald* says:—It is evident that the eruption, which was still actively at work when the despatch left, is the greatest and most terrible one of modern days. The rapidity with which the earthquake shocks followed each other, the immense streams of lava hurled upwards to a greater height than was ever known before, the earth torn and rent asunder, and the summits of lofty mountains toppling over and falling to their base, must all have formed a spectacle as magnificent as it must have been terrible. The eruption is unprecedented in the annals of modern history. Since the destruction of Pompeii and Herculaneum there has not been, as our reports would indicate, so gigantic a convulsion of nature, nor, indeed, anything approximating to the event which has transpired, and is perhaps still transpiring, in the Sandwich Islands. In 1859 the same volcano was the scene of a fearful eruption which lasted for over nine months, but it appears as if the present one exceeds it in magnitude in every respect.

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 280.)

Name.	Place.	Position.	F. or Fl.	Ht. in Ft.	Dist seen Mls	Remarks, Bearings are by Compass.
38. East Beacon	Sandy Hook	Point North	F.	33	9	Established 31st May, 1868. See No. 38. See Note *a*.
Combahee Bank	St. Helena Sound	... ...	F.	...	11	Est. 22nd Feb, 1868. In fog, a bell sounds every ten seconds.
Half Moon Reef	Matagorda Bay	... ...	F.	34	6	Established 20th Feb., 1868. *Red*
39. N. Burford Bank buoy	Dublin Bay	Changed	...	...	...	See Notice No. 39.
40. Kherson Bay	Black Sea	... ...	...	...	...	
Kinburn Lt.	Changed to	Ajighiol	...	...	...	See Notice No. 40—(*a*).
Berezan Lt.	... ...	... ...	...	...	...	Ditto, (*b*).
Souvoroski	Mound	46° 37'·5 N. 31° 30 E.	F.	148	18	Ditto, (*c*).
Algiers	Harbour	North Mole	F.	36	...	Red.
		South Mole	F.	36	...	Green.
41. Bathz	Schelde	Fort	F.	30	9	Not said.
Ditto	Ditto	Ditto	F.	18	9	Ditto. See No. 41.
42. Cartagena Port	Spain	... ...	...	...	...	Jetties.
43. Sapelo I. South end	United States	31° 25'·5 N. 81° 16'·9 W.	F. & I.	75	14	Established 15th April, 1868. See No. 43. Note *a*.
Ditto	... ...	Beacon Lt.	?	46	10	Ditto. See Note (*b*) and addition.
44. St. Andrew Point	Georgetown P. Edwd. I.	46° 10' N. 62° 31' W.	F.	36	8	Established 20th April, 1868.
45. Caldera Port	Point at West Entrance	27° 3' S. 70° 53'·5 W.	F.fl.	123	15	Established 1st March, 1868. See Notice 45.
46. Lucifer Shoals	Wexford Coast	52° 21'·5 N. 6° 9'·2 W.	F.	39	...	See Notice No. 46.
47. St. Catherine's	I. Wight Fog Signal	... ...	...	...	...	See Notice No. 47.
Governor Rock	Falmouth Buoy	... ...	...	...	...	Ditto, ditto.

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

No. 38.—*(a) New York Bay.*—The lighthouse recently erected, is on a line with the main light and the old East Beacon, and 284 yards nearer the north point of the Hook than the old beacon.

At the same time, a powerful fog signal (siren), worked by steam, will take the place of the present fog bell: A blast of *ten seconds* duration will be issued at intervals of *forty-five* seconds during foggy weather.

No. 39.—The Burford bank, at the entrance of Dublin bay, having extended further to the northward than marked in the Admiralty Charts, vessels should give the North buoy of the Burford bank a wide berth in passing.

No. 40.—BLACK SEA.—*Alteration in Lights at entrance of Kherson Bay.*—The Russian Government has given Notice that the following alterations have been, and will be made, in the lights at the entrance of Kherson bay.

(a) Removal of Kinburn Light vessel.—The same *fixed* white light is exhibited as before.

The former position of the light vessel at the extremity of Kinburn spit has been marked by a large *black* buoy.

(b) Alteration in the Berezan Lights.—The upper wooden beacon lighthouse at Berezan has been replaced by a stone pyramidal lighthouse exhibiting the same light as before.

The lower beacon lighthouse has been removed 100 yards nearer the sea, in the same line of direction from the upper beacon as before.

The upper light is now elevated 79 feet above the level of the sea, and the lower light 23 feet; they bear from each other N.W. $\frac{1}{2}$ W. and S.E. $\frac{1}{2}$ E., distant 682 yards.

(c) Fixed Light at Souvoroski.—Visible from between the bearings N. by E. $\frac{1}{2}$ E. and N.E. $\frac{3}{4}$ E., or between the banks of Kinburn and Berezan island.

Directions.—To enter Kherson bay, steer for the Souvoroski light until the two beacon lights of Berezan are in a line, when the course must be altered to keep them so.

Note.—Until the lighthouse at Souvoroski is completed, the leading lights at Ochakov will be maintained as a guide to enter and leave the bay.

No. 41.—*Note (a)*—The East light is visible from between the bearings E. by S. $\frac{1}{4}$ S. and N.E. $\frac{3}{4}$ E.

The West light is a *white and red* light, showing *white* from between the bearings E. by S. $\frac{1}{4}$ S. and N. by E. $\frac{3}{4}$ E., and *red* from N. by E. $\frac{3}{4}$ E. to W. by N. $\frac{3}{4}$ N.

The lights are placed on the rampart of Bathz fort at a distance of 153 yards from each other, on the bearing E. by N. and W. by S., and when in a line lead through the channel.

The *red* part of the West light is visible between the black buoys Nos. 2 and 3, and when two other lights shall have been placed as a guide for the upper river they will at the moment of their coming in line serve as a guide for rounding the elbow at Bathz.

All Bearings are Magnetic. Variation 18° *Westerly in* 1868.

No. 42.—MEDITERRANEAN—SPAIN.—*Breakwaters constructing in Port of Catagena.*—Information has been received from the Spanish Government,

that two breakwaters are in the course of construction just within the entrance of the Port of Cartagena, viz.:

The outer work on the West side of the harbour, extending in a S.E. direction from Point Navidad, when completed, will be 186 yards long: at the present time 22 yards of it are done from the shore.

The inner work on the East side of the harbour, commencing from the point at the foot of the battery of S. Leandro, will extend in a straight line about W.N.W., to terminate on the Laja rock. This breakwater will be nearly 870 yards long, and when completed vessels will lie alongside its inner face. The works are in progress along its whole length, but there will be water enough for vessels drawing 18 feet to pass over it during the present year.

Mariners are accordingly cautioned.

No. 43.—UNITED STATES—GEORGIA.—*Re-establishment of Sapelo Island Lights.*—The United States Government has given Notice, that from the 15th day of April, 1868, the lights on the south end of Sapelo Island, north side of the entrance to Doboy inlet, would be re-established.

Note (a) The lights consist of a main light, and a beacon light distant from it 220 yards in a south-easterly direction.

The main light is a *fixed and flashing* white light, the flashes taking place at intervals of *one minute and twenty seconds*, and the duration of the flash being *forty seconds:* it is elevated 75 feet above the high-water level of the sea, and in clear weather should be seen from a distance of 14 miles.

The illuminating apparatus is dioptric or by lenses, of the fourth order.

(b) The beacon light is visible through an arc of 90 degrees.

The illuminating apparatus is dioptric or by lenses, of the sixth order.

The main lighthouse is 80 feet high, conical, and coloured red and white in vertical stripes.

The beacon light is on a skeleton frame, painted brown.

The position of the main light is in lat. 31° 23′ 28″ N., long. 81° 16′ 55″ West from Greenwich.

(b) Directions.—The two lights in a line will carry a vessel clear of the North Breaker and the Knuckles shoals.

In reference to the Sapelo island main light:—

The notice calls this "*a fixed and flashing*" light, but with all deference to our friends across the Atlantic, no light can be considered as a *flash* that shews for 40 seconds continuously. We are told there is also a *fixed light*, by the notice. Thus the light has a double character; a *fixed light* is *always* shown, and a stronger light, or what was called in former notices, "*a glare*," is shewn every two minutes that continues for 40 seconds, which glare really is an intermitting light. The light at Cape Grinez we apprehend is an early instance of this kind of light although that is called revolving. But the revolving light implies that the light is preceded and followed by an interval of darkness, but at Cape Grinez this darkness would only be complete beyond the distance of 4 leagues. This notice appears in our volume for 1842 (p. 285), where it is even called a Revolving light; but is evidently similar to that at Cape Grinez in our volume for 1848 (p. 615), called an intermitting light which two lights are distinguished by their intervals. Still it would appear that both of these lights are more entitled to be considered as flashing than one in which the bright glare endures for 40 seconds. The main light of Sapelo

Island by the notice has no such pretensions, but it has an additional light of 40 seconds duration every two minutes, and is thus a fixed and intermitting light.

No. 45.—The flashes occur at intervals of *one and a half minutes.*

The lighthouse is built of wood, 43 feet high, square, and painted white; from it Cabeza de Vaca point bears N. ¾ W. distant 12 miles. Morro point bears S.W. ¼ S. distant 6¼ miles.

Bearings are Magnetic. Variation 13° 50′ *Easterly in* 1868.

No. 46.—Light Vessel near Lucifer Shoals.—With reference to Notice to Mariners, No. 45, dated 30th August, 1867, the office of Irish Lights, Dublin, have given Notice, that a light vessel has been placed near the Lucifer Shoals, Wexford Coast.

The light is a *fixed red* light, elevated 39 feet above the level of the sea.

The light vessel has three masts, and carries a globe at the mainmast head, from which mast the light is exhibited; the hull is painted black, with a white stripe, and the words *Lucifer Shoals* in white letters on the sides. Position, lat. 52° 21½′ N., long. 6° 9′ 15 West from Greenwich. She is moored 2½ miles to the Eastward of the Lucifer Shoals in 21 fathoms at low water with the following bearings, viz.—Tuskar Lighthouse, S.W. ⅜ S., distant 9½ miles. Blackwater bank Light vessel N.E. ¼ N., distant 9 miles. Blackwater head, N.N.W. ⅜ W., distant 7¾ miles. Cahore point, N. by E. ¾ E. distant 12½ miles.

All Bearings are Magnetic. Variation 24° 20′ *Westerly in* 1868.

No. 47.—England, South Coast.—*Fog Signal at St. Catherine's Lighthouse, Isle of Wight.*—The Trinity House, London, has given Notice, that from the 1st day of June, 1868, a powerful Fog Horn will be sounded in foggy weather from St. Catherine's lighthouse, Isle of Wight.

The mouth of the horn is at an elevation of 81 feet above high water, and will traverse an arc of 215 degrees, viz., from E. ¾ S. round by South to N.W., and will point in every direction between those bearings once in each minute; the duration of the sound being *five seconds*, with an interval of *fifteen seconds* between each blast.

Buoy on the Governor Rock, Falmouth.—Also, that a can buoy, *chequered black and white*, has been placed to mark the position of the *Governor* rock, entrance of Falmouth harbour.

The buoy lies about 60 yards E. by S. from the rock, in 15 feet at low water spring tides, with the following marks and bearings, viz.:—The East end of Falmouth Dock breakwater touching the pier head at Flushing, N.W. ¼ N. The Black rock beacon, S. ¼ E., distant half a mile.

All Bearings are Magnetic. Variation 22½° *Westerly in* 1868.

Darra Salaam Harbour, *E. Africa.*

Commander Richard Bradshaw, H.M.S. *Star*, 1867, gives the following account of the harbour of Darra Salaam on the Eastern coast of Africa, 41 miles South from Zanzibar, and nearly in lat. 6° 49′ S., long. 39° 22′ E. It is situated in a bay and is 12 miles N.W. by W. ½ W. from point Motumoko.

To approach the harbour from Zanzibar, after passing Choomby island, in order to avoid the Tom shoal, the course is S. by E. ¼ E. until Sindo

island is clearly made out, bearing about S. by W. ½ W.: then steer so as to keep Sindo island on the port hand, passing about three quarters of a mile from it with the Goonja islands to starboard. The coast, which is low, will now be clearly seen, and between two red cliffs, about 80 feet high, is the harbour of Darra Salaam, the entrance being nearly opposite the eastern cliff.

There is good anchorage outside under Sindo island, two buoys (a cable and three quarters apart) will be seen about half a mile distant from the East cliff; they are placed on the edge of the reefs between the West and East cliffs, in 3½ fathoms at low water; they bearing W. by S. ¾ S. and E. by N. ¾ N. from each other. A vessel approaching the buoys when taking the harbour should not have less than 5 fathoms; the water deepens between them to 9 and 10 fathoms. Immediately after passing the buoys, alter course quickly to S.W. by W. ½ W., keeping the inner point (forming the left extreme of a long sandy beach) a little on the starboard bow; not less than 5 fathoms should be found in this channel. On rounding the inner point a large sheet of water opens to view, anchor in it any where in 5 or 6 fathoms.

The entrance channel is about a mile long; narrow and straight, bounded by coral reefs; all dangers may be seen from half-way up the lower rigging. The harbour can contain a large number of ships of moderate tonnage; the Sultan of Zanzibar with his fleet was at anchor here during the visit of H.M.S. *Star*.

Tides.—It is high water, full and change, at 4h. 0m.; spring rise 12 feet.

Caution.—A dangerous coral bank five miles N.N.E. from the buoys was passed over in 3 fathoms, about an hour after low water.

The Bearings are Magnetic. Variation 10½° *Westerly in* 1868.

A new palace appeared to be nearly completed, and a town laid out here. The jungle was being rapidly cleared, and the soil is said to be good. This port it is said will supersede Quiloa as the domestic slave depôt of the Sultan, the caravans from the interior altering their route for it on account of its proximity to Zanzibar (160 miles distant), the difference being a great consideration to the Dhows conveying slaves.

Sarmiento Bank, *Magellan Strait*.

H.M. Surveying Vessel *Nassau*, while sounding on the Sarmiento Bank, struck the small pinnacle of an unknown rock, on which was 3 feet at low water ordinary springs and from 3 to 6 fathoms around it. It bears E. by S. (S. 80° E.) distant 3½ miles from Cape Virgins.

It has some kelp on, but not enough to mark it.

A shoal patch with 2 fathoms on it at low water was also found inside the Second Narrows, between Cape St. Vincent and Santa Marta island, N. by E. ½ E. (N. 16° E.) 2·2 miles from the north extreme of Santa Marta island.

All Bearings are Magnetic. Variation 21½° *Easterly in* 1868.

Liau River, *Yellow Sea*.

The following on the navigation of the Liau river and approach to Nieu-chwang, north coast of the Yellow Sea, is derived from a Notice to Mariners issued by the United States Government, October, 1867.

LIAU RIVER.—*Buoys.*—From official information two buoys, supplied by the Imperial Maritime Customs of China, are moored on the bar:—substantial iron nun-buoys, of six feet diameter, surmounted by flags of sheet iron. The outer, or entrance buoy, is in 3 fathoms at low water; its upper cone and flag are painted black and white in vertical stripes, and the lower cone red.

The inner, or upper buoy, in 2 fathoms water, with its flag, is painted black. It bears N.E. by E. $\frac{3}{4}$ E., $2\frac{1}{4}$ miles from the entrance buoy.

In the autumn, before the ice forms, spar buoys will be substituted for these iron buoys, which will be replaced in the spring.

The entrance buoy may be seen three or four miles distant; there is good anchorage anywhere N.N.W. to S. by W. 2 cables from it, with the buoy bearing between S.S.E. and N. by E.

Directions.— Crossing the Bar.—Enter at slack water of flood, pass the entrance buoy at about half a cable distant on the starboard hand. Steer N.E. by E. $\frac{3}{4}$ E., passing the upper buoy at one and a half cables on the port hand. Stand on until the upper buoy bears W. by S. $\frac{1}{2}$ S. about nine cables. Then a N.E. course for about a mile leads to the deep hole (between the fishing stakes), having good and secure anchorage in $6\frac{1}{2}$ fathoms.

The flood sets about N. by E., and the ebb about S. by W., over the bar from two to four knots. Hence the mariner must take care that those courses and distances are made good. When on the bar, avoid the middle ground, and never bring the upper buoy northward of N.E. $\frac{1}{2}$ N.; avoid the dangerous spit on the western bank, and never let the upper buoy bear eastward of E N.E. When above the upper buoy, avoid another projection from the western bank, by not bringing it to bear southward of S.W. by W.$\frac{1}{2}$ W. until it is above one and a half mile distant. The western bank is steep-to; but the eastern bank is shelving.

Up the River.—From the deep hole, with the English Admiralty Chart, and a quick lead, a vessel may reach the Yin-koa, by feeling her way along the eastern bank to the flag-staff beacon, then stand across for the point on the western shore, and with the lead going follow it along the bend to well above the eastern point, and take an anchorage off the town.

Tides.—The highest occur about two days after full and change; the ordinary rise about 11 feet, occasionally only 5 feet. Sometimes 4 fathoms may be carried over the bar. The morning tides are least trustworthy, the rise being then comparatively small. A fall of from one to two feet will be found before the ebb-current sets out on the surface; and a corresponding rise before the flood-current sets in. Amid such irregular tidal variations, one of those pilots should be employed who are always cruising off the bar, frequently as far to the southward as the Bittern shoal.

JAPAN ISLANDS.—On Wada-sima harbour, East coast of Sikok, in the Kii channel, by Navigating Lieutenant F. A. Johnston, of H.M.S. *Salamis*, 1867.

WADA-SIMA HARBOUR is in latitude 34° 0′ N., longitude 134° 39′ E., has good anchorage in from 4 to 6 fathoms water, just inside a low wooded point on its east side.

There is a patch of rocks, showing about 2 feet above low water N. by E.

one and a half miles from the low point; in wind or swell they break heavily, but in calm they are more dangerous having 10 fathoms water, mud bottom, close to.

Enter the harbour from the eastward steering East for the low point, and round it about half a mile off, although there is deep water close to the point.

The south and west parts of the harbour are very shoal. On its west side there is a conspicuous bluff wooded point, with some large rocks off it, round which, to the northward of this point, is a landing place; and inside the bluff is a small fort built to carry four guns, two commanding the entrance to Tatsiye and two commanding the landing place, but none appeared to be mounted.

All Bearings are Magnetic. Variation 2° 50′ *Westerly in* 1867.

NOTES ON NOVELTIES.

IN reference to the account of the attempted assassination of the Duke of Edinburgh, related in a former page, we have been gratified by finding the following in the prints of Monday, May 25th.

The Secretary of State for the Colonies received on Saturday afternoon (the 23rd) the following message from the Earl of Belmore, dated Sydney, April 22nd, and telegraphed from Point de Galle on the 15th instant:

"H.R.H. the Duke of Edinburgh resumed command of the *Galatea*, and left Sydney on April 6th, when the external wounds inflicted by the bullet had completely healed. O'Farrell was executed yesterday.—H. S. BRYANT."

CERTAINLY we could never have anticipated that we should ever have met with such remarks as the following in reference to the management of that old established company the Peninsula and Oriental. And yet there stands the charge which it is very justly said should be taken up, not it is to be hoped by "some" member of Parliament, for we cannot believe such a condition of affairs will be allowed to remain long enough. And we are satisfied that as the only mode of transit to our East India Colonies, the Peninsula and Oriental vessels will find it more their interest to attend to the comforts of their passengers than to those secondary profits that may be derived from freight.

An article complaining of the new mail contract with the Peninsula and Oriental Company, describes a grievance of homeward-bound passengers from India in the following terms:—It is not intended here to go into full enumeration of the preventible miseries which afflict beyond moral and physical endurance the homeward-bound Peninsula and Oriental passengers; but there is one abuse that is just now pressing heavily upon them, and which, if some peremptory steps are not taken, may within the next few weeks produce very serious effects on many of the weaker passengers. Cotton having for another brief

period resumed its despotic sway, the Indian exporters are naturally eager to get as much as possible sent home before the Liverpool speculators awake from their dreams; hence every Peninsula and Oriental vessel that leaves for Suez is being crammed to its utmost capacity. The result is that every available space is occupied with cargo and baggage, the ships are weighed down in the water, and—the ports are shut. What this means at this season, or at any time in the Red Sea, can be understood only by invalids or by those who have to see their near relatives suffer either from the stifling atmosphere of the small cabins, or from the exposure and harassing inconvenience of spending wearisome days and wasting nights on the quarter-deck. Any ordinary merchant company would be fully justified in making the most of the present demand for overland freight, but the Peninsula and Oriental is in an entirely different position. Having just received an extravagant subsidy for the conveyance of the mails, which enables the company to exclude all competitors from the line east of Suez, it is virtually a breach of contract to load their vessels so heavily as to destroy the comfort and imperil the health if not the lives of their passengers. This is done when the steamers are sunk so deep with cargo that the cabin ports have to be closed.

The *Times of India* further says that the subject "ought at once to be taken up by influential parties at home, and it would afford fair opportunity for some member of Parliament to demand that the whole terms of the mail contract should be revised on the ground that it was carried by surprise."

English wrecks at the Antipodes, *and the Ground on the Coast of Cornwall.*

A paper that has been sent to us, entitled "Wrecks at New Zealand," reveals sad havoc in our shipping on those distant shores—as well as some trite remarks on the subject of insurance that will, no doubt, be looked to by those concerned. The recent loss of three first-class wool ships, it is observed, on the East coast of New Zealand, should make owners of vessels and underwriters pause before taking risks to these dangerous open roadsteads. About thirty miles from Dunedin, the *Water Nymph* and *Star of Tasmania*, the *Exchange*, at Napier, Hawkes Bay, the steam-ship *W. Miskin*, at Timaru, Canterbury, and the *Fortune*, at Hokianga North Island, are wrecked, shewing the danger of open roadsteads. The following extract from the *Otago Daily Times* alludes to the risk of Insurance Companies in allowing vessels to remain in those roadsteads for months with the same rate of premium as if they were safe and snug in harbour. It is observed, that scarcely a summer passes without a vessel being lost at either Napier or Omaru. New Plymouth, is a no less dangerous roadstead. There can be no doubt, that large vessels should never discharge or load at any of these roadsteads, not even were proper moorings laid down. The wool should be shipped to adjacent ports by steamers or coasting craft. The account above referred to says, "From the North the accounts

are frightful. At Omaru, shipping have suffered fearfully: the pretensions of the place as a port are for ever gone. It may be said, the jetty can be repaired, but no sensible person will deny that the construction of a jetty was a mistake, and that the formation of a breakwater would be another, in fact, literally throwing money into the sea." How the Insurance Offices could have been mad enough to sanction by insuring the location of splendid vessels in this dangerous roadstead for weeks together, is above comprehension. It is very clear that what Omaru requires and what it should unquestionably be granted, is an efficient, first-rate boat Service. The Service should not be considered a means of enriching its proprietary, but should be worked with the view of placing at the command of skippers and importers, the very cheapest facilities possible. It should be a service able to load or unload small vessels and steamers in a few hours. A single hour's unnecessary detention should be avoided. Omaru has large claims on the province, and such a service should be provided till the railway at Mooraki is completed.

Turning from the shores of New Zealand to those of Cornwall, we perceive the papers of the day relating with all its painful details, an account of the wreck of the steam-ship *Garonne*. It would scarcely be believed that in these days a vessel like this would rush with all speed across the mouth of our channel from Bordeaux on a northerly course (or half a point East or West of it) without making sure of being clear of the Cornish coast, and in the fairway of the St. George's Channel, by feeling her way by a timely cast or two of the lead. Had she done so she could not have failed to discover her mistake by the decreasing depth as she approached the shore. All that we can find about it is that the deep-sea lead was ready to be hove, but wanted some tallow for arming, and while this was being applied, the ship had run on a dangerous reef called the "Bucks," on the shore of Mounts Bay, about a mile and a half from Lamorna Cove. We can find no where in the narrative that the lead was even overboard. But had this been attended to in time, there can be no doubt that the vessel would have been saved from this disaster with all the lives and property thus sacrificed. Half an hour, or even an hour might have been lost, but the vessel was going ten or eleven knots an hour, and look at the trouble of sounding. So this trouble was saved at the cost of the lives of her captain, mate, and two stewards, with fourteen of her passengers, vessel and cargo. The *Garonne* was intending apparently to take the channel between Scilly and the Land's End, always a questionable course at night, and yet was not sure of her position. Captain Drew, who perished with his ship, bore the character of an excellent officer: but alas, how often do even excellent officers lack a little discretion that would avert these sad disasters!

Conclusion of the Abyssinian War.

We gladly find sufficient reason in the assistance rendered by the Royal Navy for placing a record in our pages of the termination of the Abyssinian war. And this we do in preserving one of the last

allusions to it by the accomplished correspondent of the *Daily News*, who gives the concluding excellent address of Sir Robert Napier to his troops, with some very apposite remarks of his own, in the justness of which we most heartily concur.

The Djedda, April 23rd.

The campaign in Abyssinia has now been formally declared to be at an end. On the 20th instant, a grand review of the troops composing the first division of the force was held on Dalanta-plain; and after a few military evolutions had been performed, his Excellency Sir Robert Napier complimented the army on the very successful termination of their labours, and caused to be read to them the general order about to be published to them, to the nation, and to the world. Never was military display more successful or imposing, or regiments more completely inspired with martial feeling. Every one felt that it was no ordinary "vain show" in which he was taking part, but an unanimous expression of mutual confidence, mutual respect and pride in each other, and general congratulation and rejoicing at the success which had attended their arms. Few reviews of similar importance have ever had a more limited assemblage of spectators; but none ever had a more admiring one, or one more prized and at the presence of which officers and men were more delighted. There was no grand stand or array of rank and beauty; but the group of rescued captives was there, and proudly the army of Abyssinia marched before them. No huzzas and ringing cheers arose as regiment after regiment and battery after battery marched by; but from underneath that flag, sadly faded from exposure to Abyssinian sun and storms, arose many a heartfelt blessing and many a fervent prayer; yea, the tears of joy and thankfulness that streamed unchecked down many a care-worn cheek proclaimed the feelings of the small band of spectators more unmistakeably than any more demonstrative token could do. And they were, too, a more deeply felt reward.

The review over, a hollow square was formed, in the centre of which were ranged the Commander-in-Chief, his staff, and the rescued captives, old men grown grey from age, and young men grown grey from care, fair dames who had never till now known what it was to be free, and children in arms, born in captivity. Sir Robert, in a few brief, appropriate, and soldierly sentences, complimented his army, introduced the captives to "soldiers and sailors of the Army of Abyssinia," and called upon Colonel Thesiger, the Adjutant-General, to read the following order:

Soldiers of Abyssinia,—The Queen and people of England entrusted to you a very arduous and difficult expedition—to release our countrymen from a painful and long captivity, and to vindicate the honour of our country, which had been outraged by Theodore, King of Abyssinia. I congratulate you with all my heart on the noble way in which you have fulfilled the commands of our Sovereign. You have traversed, often under a tropical sun, or storms of rain and sleet, four hundred miles of mountainous and difficult country; you have crossed many steep and precipitous ranges of mountains more than ten thousand feet

in altitude, where your supplies could not keep pace with you. When you arrived within reach of your enemy, though with scanty food, and some of you for many hours without either food or water, in four days you passed the formidable chasm of the Beshilo and defeated the army of Theodore, which poured down upon you from their lofty fortress, in the full confidence of victory. A host of many thousands have laid down their arms at your feet. You have captured or destroyed upwards of 30 pieces of artillery, many of great weight and efficiency, with ample stores of ammunition. You have stormed the almost inaccessible fortress of Magdala, defended by Theodore with the desperate remnant of his chiefs and followers. After you forced the entrance, Theodore, who never showed mercy, distrusted the offer of mercy which had been held out to him, and died by his own hand. You have released not only the British captives, but also those of other friendly nations. You have unloosed the chains of more than 90 of the principal chiefs of Abyssinia. Magdala, on which so many victims have been slaughtered, has been committed to the flames, and remains only a scored rock. Our complete and rapid success is due, first, to the mercy of God, whose hand, I feel assured, has been over us in a just cause; secondly, to the high spirit with which you have been inspired. Indian soldiers have forgotten the distinctions of race and creed to keep pace with their European comrades. Never has an army entered on a war with more honourable feelings than yours; this has carried you through many fatigues and difficulties. You have been only eager for the moment when you could close with your enemy. The remembrance of your privations will pass away quickly; but your gallant exploit will live in history. The Queen and the people of England will appreciate your services. On my part, as your commander, I thank you for your devotion to your duty, and for the good discipline you have maintained. Not a single complaint has been made to me against a soldier of villagers wilfully molested in property or person. We must not forget what we owe to our comrades who have been labouring for us in the sultry climate of Zoula and the Pass of Koomaylee, or the monotony of posts which have maintained our communication. Each and all would have given all they possess to be with us, and they deserve our gratitude. I shall watch over your safety to the moment of your re-embarkation; and to the end of my life shall remember with pride that I have commanded you.

R. NAPIER,
Lieutenant-General, Commander-in-Chief.

Camp Dalanta, April 20th.

Such an order needs no comment; but I cannot dismiss the subject without noticing its extreme simplicity and comprehensiveness. It is a bare recital of facts, to the truth of which everyone connected with the campaign can testify; and it conveys a vivid impression of the tremendous difficulties overcome, and the complete success which has been attained. No one is better able than Sir Robert Napeir to form a correct estimate of the obstacles surmounted, the fatigues and

privations endured, and the success achieved by the force in Abyssinia, and no general more ready to give the soldier that meed of praise which is his due.

THAT invaluable institution which protects the lives of our seamen on their own shores pursues its avocations with ever renewed energy, and here is one of their eventful lifeboats.—About sixteen months since the working people of Edinburgh collected the cost of a lifeboat, which they presented to the National Lifeboat Institution, and which is stationed at Port Logan, on the coast of Wigtonshire. The donors decided to associate with their boat the name of Mr. Ballantyne, the well-known author of "The Lifeboat," and other popular works; and the boat was accordingly named "Edinburgh and R. M. Ballantyne." On the way to its station the lifeboat was exhibited both in Edinburgh and Glasgow. While it was at the latter city the wife and children of the captain of the Glasgow barque *Strathleven* went to see the boat, and the mother put an offering in the contribution box for the benefit of the lifeboat. This was on the 17th of December, 1866, and, strange to say, that very day twelve months—that is on the 17th December, 1867—this incidental lifeboat was providentially the means of rescuing the master and his crew, consisting of fourteen men, of the *Strathleven*, which was wrecked a few miles from the Port Logan Lifeboat Station. Another remarkable feature has now occurred in the history of this boat. The late Miss Elliott Lockhart, of Edinburgh, in conjunction with Miss Mary Oliver and other ladies, and Mr. R. M. Ballantyne, determined to raise £1,000 in Edinburgh and its neighbourhood for the purpose of keeping up the lifeboat in perpetuity. Accordingly the first instalment of £650 has just been remitted by Miss Oliver to the National Lifeboat Institution, and she expressed a hope of being able by-and-by, to collect the remaining sum. She sincerely laments the death of her valued coadjutor, Miss Lockhart, who had made great efforts to raise the sum needed; she herself, in fact, by her own untiring exertions had collected the greater part of the large sum already remitted to the Society.

ENCROACHMENTS OF THE SEA.—There is a continual battle going on between the sea and the land. The rivers are constantly carrying large quantities of matter in suspension to the deep, and depositing beds of detritus along its bottom, to be afterwards compressed into strata, and ultimately formed into dry land. The ocean, on the other hand, is perpetually thundering against our shores, grinding down the rocks, and changing the configuration of the coast. During the last few weeks the combat between the power of the sea and the endurance of the land has been characterised by more than customary violence, and on Sunday last the waves succeeded in making considerable encroachments in the neighbourhood of Worthing, in consequence of the removal of several groynes from the shore in front of Beach House. Immense quantities of shingle had previously been washed away, exposing an unsightly surface of rocks, marl, and clay, but the full

tides of Sunday wrought great havoc in undermining the sea wall, which is about twenty-four feet high. About midnight it fell down with a terrific crash, and the angry waves dashed into the breach which they had formed. The next day about a hundred feet more of the wall gave way, and some thousands of pounds will have to be expended to make good the ruin which has been caused. It is singular that the danger should not have been sooner seen and provided against. The action of the sea, though persistent, is slow and gradual. It does not resemble the explosive force of gunpowder, which is quick, sudden, and immediately destructive. Its approaches are, on the contrary, insidious, and its ravages can, for the most part, be seen and checked. The force of the waves is only irresistible after they have succeeded in making a breach, and have thus secured room and verge enough for the full exercise of their powers. We have no doubt that the condition of the wall at Worthing had long been apparent, and that the seasonable expenditure of a comparatively small sum would have sufficed to stave off a great possible disaster. Well, we are not wholly free from a like misfortune ourselves, and the experiences of the people of Worthing ought not to be lost upon us. We refer to the notorious encroachments which the sea is making all along the coast from Lumps Fort to Fort Cumberland, by which more than thirty feet of beach have been already wasted, while the people of Southsea run the momentary risk of being drowned out like rats. Looking southward from the ridge of Portsdown Hill, the spectator is struck with the remarkable lowness and flatness of the plain, and it appears as if the sea were only prevented by a kind of special Providence from swallowing up the intervening space. It may, however, eventually do so, unless something is done to arrest the erosive action of the waves. During calms the danger is not apparent; but we know that the house which was built upon the sand furnished a very desirable shelter until "the rain descended, and the floods came, and the winds blew, and beat upon it," and it fell. The danger to which we allude is not a new one; it has been many times referred to in these columns, —in vain. As far back as 1850, Mr. Pineo wrote to Lord Ashburton, pointing out to him the great ravages which the sea had made upon his property near Lumps Fort. During the mayoralty of Mr. Emanuel the subject was twice brought under the attention of the Local Board by the same gentleman, and with the same result. In September, 1866, the *Army and Navy Gazette*, in an article advocating a system of tramway communication between Portsmouth Dockyard and Fort Cumberland, referred as follows to the encroachments which the sea was making:—

The erection of Lumps and Eastney Forts has not only improved the appearance of the sea front, but very much strengthened it, previous inroads of the sea having washed away scores of acres of valuable ground between Southsea Castle and Cumberland Fort. This improvement having been so well commenced, we trust that the Admiralty will take immediate steps to prevent any further inroads of the sea between the points above-named; and we would suggest the employ-

ment of the Royal Marine Artillery for this work, under the supervision of the officers of the Royal Engineers of the South Western District. The wood for this purpose could be obtained from the condemned material in the dockyard, the shingle on the spot being of course used for any concrete backing which may be required. This it is believed, would effect the object in view, and that too at a very small outlay. The gales of February last must have convinced the most sceptical of the imperative necessity of some such step being adopted, as it was well known that the configuration of the beach had been entirely altered, so much so that the attention of the Local Board was called to it, and an application was made to the authorities of the War Department to continue the present esplanade from Southsea Castle to Lumps Fort, so as to form an additional buttress or support to the crest of the beach.

The Government have been for some time endeavouring, in a feeble way, to do battle with the sea, but the waves still continue to enroach upon the beach; and until the Local Board will agree to share in the work of timely preservation, we have little hopes that the work will ever be effectually performed. An arrangement was come to some time ago by which the Admiralty and the War Office conjointly agreed, that if the Local Board would continue the present esplanade to the Lumps, they would continue it as far as Fort Cumberland. The offer was liberal, and the utility of the work undeniable, but nothing came out of it. We believe the borough engineer was instructed to prepare an estimate of the probable cost, and there the matter ended. It is perhaps useless to expect that the Local Board, hampered as they are for the want of funds, will perceive the necessity of completing the work at the present time; but a "time will come," as they say at the theatre, when the work will not admit of the delay.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, *in May*, 1868. — *Sold by J. D. Potter*, 31, *Poultry, and* 11, *King Street, Tower Hill, London.*

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EDWARD DUNSTERVILLE, *Commander, R.N.*
Hydrographic Office, Admiralty, 20th May, 1868.

TO FRIENDS AND CORRESPONDENTS.

Received, and in our next—
"Sydney to Batavia late in the Season."
"Stray Notes on the Bermudas Mercator."
Philippine Islands.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

JULY, 1868.

Another account of the Attempt on the Life of the Duke of Edinburgh at Sydney.

[Notwithstanding the appearance in our last number (p. 320) of the official statement of this transaction shewing an intention so happily and miraculously diverted from its purpose; another account from a respected source places several new features of it before the world: in which our readers will see that it was with charitable motives that the meeting took place in which the Prince had done his part, and so nearly lost his life.]

Sydney, New South Wales,
March 31st, 1868.

Sir,—As an old (though not very frequent) correspondent of your valuable Magazine, I venture to address you with reference to the late wicked attempt upon the life of H.R.H. the Duke of Edinburgh at this Port. No doubt various accounts will reach you through the newspapers and otherwise all more or less correct. What I now write has come under my own notice.

As a Director of the Sydney Sailors' Home, it became my duty with others to carry out the details of a large pic-nic, which was undertaken in behalf of the funds of that institution. The patronage of our sailor Prince was solicited, and immediately granted; in fact, upon this depended in a great measure the success of the undertaking. Throughout the whole period of his visit to these Colonies, the Duke has unhesitatingly given himself up to aid any good object. In fact, so uniformly good natured has he shewn himself to be that he seems to have (at much personal inconvenience at times) endeavoured to carry out the wishes of the people whenever it was in his power to do so. As an instance of this, I may mention that on two separate occasions the days which had been fixed for our pic-nic were cheerfully altered

by him on its being pointed out that the religious feelings of some sections of the colonists might prevent their attendance on the days originally named. All this may seem but little to some persons, but those who think deeper, cannot fail to contrast these graceful concessions and courtesies with what is too frequently seen in less exalted personages.

In this case, I have no doubt, a special interest was felt in the object of the pic-nic, it being for the benefit of a class of men of the same profession as himself, and Sailors' Homes having been specially honoured by his Royal parents.

Well, the appointed day at last arrived, and all seemed to promise a grand success. The day was beautifully fine, the spot chosen, Clontarf in Middle Harbour, one of the most picturesque spots in this extremely picturesque port, never looked to greater advantage. Crowds of well-dressed persons came down in the steamers provided by the Committee, and enlivened by the bands of H.M.S. *Galatea*, and H.M. 50th Regiment, were soon in the full swing of enjoyment. At an adjacent bay a number of aborigines from different parts of the colony had been collected, and were prepared to exhibit their skill with spears, boomerangs, etc., for the amusement of His Royal Highness and the other visitors. It is not too much to say that never, since Captain Phillips first landed on the shores of Port Jackson, had so many of the sable inhabitants been congregated in that particular spot.

Luncheon had been prepared in a large tent, to which the Duke, on his arrival at two o'clock, with his suite, and the Earl and Countess of Belmore, with other ladies and gentlemen, were escorted by members of the Committee. Luncheon over, the Chairman (President of the Sailors' Home), Sir W. M. Manning, proposed the health of Her Majesty the Queen, which was, as it always has been on public occasions in this colony, enthusiastically responded to, and on the cheering ceasing, His Royal Highness, with Lady Belmore on his arm, left the tent.

I followed shortly afterwards, and whilst walking about with a lady, saw the Prince coming towards the beach, talking in an animated manner to Sir W. Manning. They were in a comparatively clear space of the ground, the people keeping back on each side at a respectful distance. I had turned my head for a moment, when I heard behind me a short, sharp discharge, followed in a second or two by another, accompanied by a cry as of pain or terror. Turning suddenly round, to my dismay, I saw the Prince on the ground, and Sir W. Manning in the act of falling. What happened thereafter no pen can accurately describe. Women shrieking and fainting, men frantic with rage and grief. The Prince was borne off to his tent as soon as possible, and received instantly surgical assistance. The would-be murderer was instantly seized, and but for the police, ably seconded by Lord Newry and some other gentlemen, would have been Lynched on the scene of his crime, a fate, though richly deserved, let us all be thankful was prevented. We are a law-loving, law-abiding people, Mr. Editor, and therefore your readers will wonder how such a cry could have been

raised, and this please observe, not by roughs or low characters (very few, if any such, were present), but by respectable members of society, some of the best and purest in the land, who in their calmer moments, would have revolted at the thought. But we are besides an intensely loyal people, and therein lies the secret of this great outburst of feeling. The son of our beloved Queen, the fountain head of all our loyalty, lay bleeding before us, and for aught we then knew dying, and men were suddenly transformed into tigers, thirsting for revenge on the perpetrator of this vile and atrocious deed. I do not believe that in such a company of ladies and gentlemen, the cry "Lynch him" was ever raised in earnest before, or met such a response, and sure I am, that no murder, however foul, would have evoked such an outburst at that time, had the crime not touched our fealty to our Sovereign. But we have great reason to be thankful that the law was permitted to take its course.

As soon as the deed became known, indignation meetings were held from one end of the country to the other, at which all traitors were denounced in unmeasured terms, and the strongest sympathy was expressed for the sufferer and his Royal mother. Amongst the first exclamations I heard upon the ground were, "his poor mother!" all thoughts turned to her.

Prayers for the recovery of the Prince were offered in all Churches and places of worship, and eager eyes watched hour by hour for the bulletins which announced the progress towards convalescence of the illustrious sufferer. And when, at length, he had so far recovered as to appear in public, and shewed his confidence in the people's loyalty by again driving through the city, their joy knew no bounds. Ringing cheers followed him wherever he went, and the city was decked from end to end with flags.

A movement has now been set on foot which promises to be eminently successful, to erect in this city, in commemoration of His Royal Highness's recovery, a Hospital for the sick and maimed, to be called Prince Alfred's Hospital. Subscriptions are coming in liberally, and one gentleman has given the munificent sum of £1000 towards it.

It may, and probably will be, said at home; Why were not fuller precautions taken to prevent such an attack upon the Prince? The answer is simply this—No one for one moment dreamed of the possibility of such a thing. Apart from his *status* as the son of our Sovereign, he had by his geniality of disposition, kindness, and affability so won the hearts of all classes, that it could not have been believed that any one in existence would attempt to harm him. He moved about on all occasions with such freedom and absence from pride or exclusiveness, that, as was well said by an eloquent speaker at our largest indignation meeting, "we absolutely forgot in consequence, the magnificence of his position."

Another trait in his character has gained for him golden opinions. He is "*Captain*" of the *Galatea* in every sense of the word. Not a mere pleasure sailor with the empty title, but one who performs all the duties appertaining to his position, and performs them well too.

The people of Sydney have had opportunities of seeing that for themselves. It was a wet and stormy morning when the ship was placed in the dry dock here, but the Captain was on board early, and superintending all operations.

One incident connected with this sad pic-nic should not be forgotten. In that short walk from the tent, before the shot was fired, the Prince handed to Sir W. Manning an envelope containing a donation for the Sailors' Home. Until his Royal Highness was pronounced convalescent, it remained unopened, and when that period arrived, it was found to contain a cheque for £50. So that had it pleased the Almighty that the wound had been mortal, the last act of the Prince's life would have been a charitable one.

I feel that I have very imperfectly conveyed to you my impression of this sad event, which can never be erased from the memories of the present generation of colonists, but you may rely upon the accuracy of all I have stated.

While I write, the trial of the assassin is going on. The only defence set up by his legal advisers is that he is of unsound mind.

I remain, Sir,
Yours obediently,
HENRY T. FOX.

P.S.—April 1st, 1868.—The prisoner, H. J. O'Farrell, was last evening found guilty, and sentenced to death for the wilful murder of the Duke of Edinburgh. H. T. F.

To the Editor of the Nautical Magazine.

Since the foregoing has been in type, the annexed interesting particulars concerning the Prince and his movements have appeared in the *Daily News*, and these we add as a satisfactory finale to the letter of our correspondent.—ED.

Just before his departure from Sydney the Duke of Edinburgh was entertained at luncheon at Government House, a number of the leading gentlemen of the colony being invited to meet him. In reply to the toast of his health, which was proposed by the Earl of Belmore, his Royal Highness, who was so much affected as to be unable to speak for several seconds, said (as soon as the cheering had subsided)—"Gentlemen, I have no doubt you will allow me to read the few words that I desire to say to you, as I do not feel equal to the task of speaking extempore. (Encouraging cheers.) In returning you my best thanks for drinking my health, I must express my regret at having to bid you farewell, and I take this opportunity of thanking you for the enthusiastic and hospitable manner in which I have been received and entertained in this as well as all the Australian colonies. The universal manifestations of loyalty to the Queen and attachment to her person and throne have ere this been made known to her Majesty, and cannot fail to have given her the liveliest pleasure. (Applause.) I must now, however, allude to the unfortunate occurrence connected with myself, which marred your festivities, and cast a temporary

gloom over the community. I sincerely regret, on your part, that there should have occurred any one incident, during my sojourn amongst you, which should have detracted from the general satisfaction which I believe my visit to Australia has given. (Loud and prolonged cheering.) The event, however, cannot in any degree shake my conviction of the loyalty of the colonists at large—(applause)—nor her Majesty's confidence in her Australian subjects. Indeed, the meetings and expressions of sentiment which have been called forth by the recent attempt on my life will show their fellow-subjects at home, and the world at large, that they not only have loyalty, but affection for their Queen and her family. (Cheers.) If there is any disaffection tending to disloyalty amongst any community in any section of this portion of her Majesty's dominions, it will be the duty of the government to put it down, and I am certain that here they will receive every support from all classes. (Prolonged cheering.) Through the merciful interposition of Providence, the injury I received was but slight, and I believe no further evil consequences are to be anticipated from the wound. (Loud cheers.) It has, however, been considered that I shall be unequal to any great exertion for some time, and therefore it has been decided that it would be most advisable for me to return home direct. It has been a great disappointment for me not to be able to visit New Zealand, and I am afraid it will also very much disappoint the people there. In thanking you once more for your kindness to me during my visit, I must tell you how much I have enjoyed it, and regret that it comes to an end to-day. Before I conclude, I will ask you to join me in a toast. I propose—'Prosperity to the colony of New South Wales;' and as this is the last opportunity I shall have of addressing an assembly of Australians, I beg to couple with it the toast—'Prosperity to all the Australian colonies.'"

VOYAGE OF H.C.M.S. NARVAEZ

From Manila to China and Japan in 1864.

(Concluded from page 314.*)*

THE Japanese has his own ideas of civilization, being purely Asiatic and full of tradition like any other ancient people. But he makes prodigious strides towards European civilization, which he endeavours to mould into his own, and from which he selects readily any of the arts and sciences. The Japanese has abundance of self-respect. He knows well where he is strong as well as his dignity, and he would fain be the friend but by no means the slave of Europe. The European in Asia accustomed to treat the indolent Indian, and the degenerate Chinaman, as their lord and master, has supposed that perhaps he might reduce the Japanese as he has done the two others to his service; but he has been mistaken. That intelligent and active

race, that body of society so completely bound together is not to be so easily ruled over as the others. Hence the misunderstandings, hence the coldness between the races, hence the war which may suddenly break out when unexpected.

The light in which the European looks on the Japanese as an inferior race does not fail to affect him. It is in fact the main-spring of his care and pains to raise himself to the level of the foreigner who thus looks down on him, and who cannot but admit but that his industry bears good results. In Nagasaki there is a steam factory at work managed entirely by Japanese. Last year a similar factory was burnt by the English at Kagosima. The Japanese Royal Navy is said at present to contain forty-three steam vessels. The whole of them no doubt were built in Europe or America, but there is not a man or officer in them who is not a Japanese. Some curious anecdotes about these are commonly told. Thus it has happened that they were unable to stop the complicated machinery of a vessel which continued steaming about one of their ports until the steam was expended. There is another also of a steamer which was lost from the want of knowing how to stop the engine at a critical moment. But they do not admit foreign engineers into their vessels on this account. They are providing their troops with muskets and throwing off their old established ways to learn European tactics. The sciences, languages, and arts of Europe have their halls in several of the principal cities of Japan. I have myself seen officers of the Japanese Navy who spoke English, French, and Dutch.

Now all this has been acquired in Japan in a little more than nine years. It is well known that from Commodore Perry's expedition in 1855, Japan opened the ports of her empire to the civilized world that had been hermetically sealed for more than two centuries.

But here are a few personal observations of Japanese character selected from among many others.

The governor of Nagasaki once asked me, If a Japanese ship of war went to Spain, would she be received? How would she be treated? I naturally answered him, "In the same manner as any other foreigner." On which his countenance brightened up with an expression of much satisfaction. And I am persuaded that he had an object in endeavouring to ascertain if we also considered the Japanese an inferior race of people.

During scarcely a week while we were there, a Japanese by sheer questioning our people formed an extensive Spanish vocabulary, by means of which he could express himself in our language. He was not one of those pedlars who are met everywhere in Asiatic ports employed I rather think by the custom house. In the latter part of the time we were there I was surprised at his addressing me in the language of Cervantes, which he pronounced with something of an Italian accent.

Another man who belonged to the custom house and who knew English very well, was not satisfied until he got some Spanish books and a letter from the seamen, and I taught him the pronunciation of

Castilian, I wrote down in the Japanese character letters which would produce their sound, and he came again the next day begging of me to resume the lesson.

When we were treating about embarking coal a Japanese official came on board asking for our engineer, that he might choose the quality. The coal was brought on board in boats each one in charge of a subaltern officer. The first who came produced a statement of the quantity he had brought, shewing a wish that they might be weighed. I considered this was not necessary, for by the fuel consumed by the engine we could ascertain how many tons we had received. This evidently gave him much satisfaction as well as surprise, and I gave directions that afterwards no supply of fuel should be weighed, depending on their account of what they delivered to us. When other functionaries brought their bills for payment the day before our departure, and our purser paid them, they would not even count the money.

I could enumerate many other equally good traits of these people. Nothing of this kind however is known in China!

Japan is a feudal country powerfully organized, the power of the government is felt by all, and extends to every part of the country. There as well as in most other ancient countries the government by itself constitutes the nation. Besides the government there is nobody. Everything in the country, every bit of Japanese territory, belong to the aristocracy of the empire or depends immediately thereon. Thus it is that they govern the land as they would their own property. There the people are nobody and are absolutely helpless. Nearly all are employed by the government, which gives food and occupation to the people. For my part I consider that the actual condition of Japan is much the same as that of the Roman empire in the times of the Cæsars. The analogy is in fact very remarkable, although the proportion is considerably smaller. There is the same strength of government, the same want of power in the people, the same amount of force in the union of the two elements, the same observance of habits and customs, the absence of all religious persuasions, similar religious materialism, and even the same germ of the idea of emancipation of man, which is beginning to grow in the minds of all the lower classes of Japanese, and which is no other than the same Christian idea which first shewed itself in the minds of the Roman slaves, and ended by overturning the empire.

Europeans would fain reform and assimilate this state of Society by means of commerce and war. I think they are mistaken. Japan will never be reformed except by Christianity, which is what reformed the Pagan society of ancient Rome. When Christianity reforms Japan her assimilation with Europe will be completed. This the Japanese government instinctively knows, and defends herself against Christianity as her natural enemy.

As to the rest commerce is convenient to her, and for war she cares not: that unrolls the resources of the country, opens the markets for the display of produce, and initiates them to the arts of Europe. And

as to war, the great distance which separates Japan from the Western powers, the special constitution of the nation eminently adapted for war, and the elevated feeling which exists among the race, are sufficient motives for the Japan government to have no fear of consequences. Without seeking for further instances let that suffice which took place less than a year ago at Kagosima; where a strong English squadron were compelled to retire from before the batteries of the prince Satzuma, after a fruitless carronade, being cut up with much severity, and without attaining the object in view, is a proof that the Japanese are not to be overcome by arms so easily as are the Chinese.*

Such remarks may, however, be out of place in this communication.

Nagasaki is a city of 80,000 inhabitants, standing on tolerably broken ground. Its port is most secure and sheltered from all cases of bad weather. There is a crowd of Europeans who occupy ground apart from the city towards the sea. Nevertheless, the Dutch continue to reside in the celebrated islet of Decima, the bridge of which is not really closed. On one of the heights at the back of the city, is shown the place of execution of the martyrs of Japan.

When we anchored here, we found three English ships of war (the *Rattler*, of 17 guns, another smaller vessel, and a gun-boat): the French despatch boat, *Tancredi*, some twenty merchant vessels of different countries, as well as some steamers, and two Japanese sailing vessels, besides a large collection of junks as coasters. In the city, the Consuls' flags were gaily flaunting in the breeze, among which were those of nearly all the European States, including those of Prussia, Portugal, and Switzerland. It was a melancholy sight to behold our own solitary flag, with no similar companion amongst them that could hold out our welcome to the shore.

During our stay at Nagasaki, we have been treated with marked attention by various individuals of European society. The French Consul came on board the day after our arrival, to offer his services instead of a Spanish Consul. The attention was duly acknowledged, but as we were in direct communication with the Japanese authorities, his assistance was not required.

We replenished our coal, taking on board ninety-three tons of very good fuel, which cost three hundred and forty-five dollars (about 3·70 dollars per ton). I knew that coal was good and cheap in Japan; but I did not expect to find it so reasonable.

The English coal found in the Chinese markets is very little superior to the Japanese, and costs seventeen dollars the ton at Shanghae and

* The Spanish officer who makes this information a portion of his official report seems to have been sadly misinformed on this subject. When our ships retired from before Kagosima, the batteries were all destroyed, the prince's palace and his town were burnt and even his steamers captured: what else was there to be done to punish him: surely not to shoot down his helpless people who had done nothing to us? Our object *was* thus attained, it was no "fruitless" carronade by which our ships destroyed the batteries and burnt the town, a fact to which he himself has alluded in a former page. The truth of these assertions will be found in Admiral Kuper's dispatch, printed in our volume for 1863, p. 642.

Yen-tai. The coal which we got at Manila direct from England, which is deteriorated, cost fifteen dollars the ton. The ship steaming at her usual rate, consumes twelve tons a day from our bunkers. On this voyage she has consumed thirteen tons of the Chinese, and sixteen tons of the Japanese, going always at the same rate, that is 6·5 miles an hour with eleven to twelve pounds pressure of steam, and working at the second grade of expansion. Thus, then, the price of a day's work with the fires lighted with Shanghae and Yen-tai coal has been two hundred and twenty-one dollars, and with the Japan coal only fifty-nine dollars. The economy of one coal over the other has therefore been $\frac{162}{221}$, which is 73·5 per cent. of the whole cost. Or twenty-six and a half dollars worth of Japan coal has done the same work as one hundred dollars worth of the English coal obtained from the Chinese markets. These figures require no comment.

Having completed the vessel with fuel, water, and provisions, we left Nagasaki on the evening of the 5th of July, steering for Hong Kong.

I cannot neglect stating an opinion which is unanimous, not only on board my ship, but also among the European residents in Nagasaki. "If the Spanish government should ever determine on establishing relations with Japan, the position which the *Narvaez* occupied at Nagasaki has much facilitated that object." This sentiment was expressed by every one on our leaving that place. And I can also add, from my own experience, that Spaniards are both known and esteemed in Japan.

Having sailed from Nagasaki on the evening of the 15th, we used our steam and sail, and on the 20th entered the Formosa channel, where we experienced the usual bad weather for the time of year. So bad was it that on the night following, both our courses were split from top to bottom. Fortunately they were old, so all that we did was to secure them to the yards, and on the 22nd, we anchored at Hong Kong.

The continued bad weather obliged me to wait for filling up with coal much longer than I had intended. I was enabled to embark eighty tons at thirteen and a half dollars per ton, and on the 2nd of August we sailed for Canton.

On running up the river, when just before reaching the second bar of Lintin, we observed a Hamburgh ship aground, making signals. We stood towards her, and I sent a boat with an officer, whom her captain asked for assistance. Her name was the *Malvina Vidal*, Captain J. L. Kessal. Having grounded on the previous evening, she was by no means in a pleasant situation, and surrounded by Chinese boats, which had flocked about her as crows would round some carrion. I got a towline from her to haul her off, but without success, for she was a vessel of 1300 tons and quite full; but our presence, and that of our boats, cleared her of the crowd of Chinese lorchas. We anchored alongside of her, and after sounding about her, I considered it possible to haul her off stern foremost at high water. We therefore altered the position of our vessel with that intention, and at nine in the

evening made an attempt, but only moved her a little. At daylight the next morning, we anchored our ship close to her, and at high water, we had the satisfaction of fairly dragging her afloat, and brought her up at her anchor in six fathoms of water. She was therefore safe, and about noon we continued our voyage. That evening at eight, we anchored at the second bar, the tide preventing our progress until four in the morning, leaving which anchorage, we arrived off Canton in the following evening.

From Canton, the *Narvaez* proceeded to Hong Kong, and thence to Manila, where she arrived on the 22nd of August.

[We have translated the account of this voyage from the fifth volume of the Anuario de la Direccion de Hidrografia, published at Madrid, as an interesting narrative in the absence of those voyages of discovery and exploration, which in former days occasionally appeared among the annals of the British Royal Navy. We quite agree in the truth of the strong contrast which is drawn in the narrative between the Chinese and Japanese, so sadly unfavourable to the former, and we entertain the same high opinion of the Japanese as does our author. He considers the latter a fighting people, and here again they are, no doubt, a far superior race in this respect to their neighbours, the Chinese. And although they may be ready to attack any European power, there can be no doubt that, let their strength be what it might, they must come out of such a war the greatest sufferers in the end. Their *lonins* are excellent *bravos*, as they have too often proved themselves; but we admire the general character of the country people, and have no doubt, that they are courageous, as well as tractable, and when respected as they should be, and will be when they are known, that they would form just such companions as would suit an Englishman.]

SYDNEY TO BATAVIA LATE IN THE SEASON.

Notes on passing dangers.—Booby Island Post Office.

By Capt. J. L. B.

SIR,—Will you give the following remarks a place in your valuable journal, should you deem them of sufficient worth.

Much has been said about the time of year, etc., for adopting the route through Torres Strait. And among many other's, I am willing to give my experience. I have been through these Straits several times, and twice very late in the season. But I wish to refer more particularly to my last voyage.

I sailed from Sydney, March 26th, 1867, in a vessel of four hundred tons, bound for Batavia; the vessel, not a clipper by any means, and had also seen better days. I therefore did not like Cape Leeuwin and its stiff *Westers*, and I at once bore up for Torres Strait, although so late in the season.

After passing the parallel of Sandy Cape, in long. 157°, I experienced calms and light variable winds chiefly from N.W. to N.E. and easterly, as far as lat. 18½° S., long. 156° E., thence fine steady easterly breezes with *clear* weather. I reached Booby Island on the twenty-fourth day out, having been only in the Straits about forty hours. I passed, as I always do, through Bligh's Channel. Experienced fine easterly winds down the Arafura Sea (say six knot breeze, or eight for a fast vessel), accompanied with a fine westerly current of two knots as far as the meridian of Sandalwood Isle; then variable winds for a few days, settling at last to steady westerly breeze moderate and fine. I stood to the southward to lat. 18° S., and from thence had strong S.E. and southerly winds up to Sunda Strait, arriving at Batavia on the sixtieth day.

The whole of this passage was marked by continual fine weather, and very clear sky, and not as is the prevailing opinion, constant calms, thick, hazy weather, sun not visible for days together, etc., as I have been informed several times would be the case. However others may differ, I must say I never experienced clearer or better weather for making the Straits. In December, 1861, I went from the head of the Gulf of Carpertaria down the Arafura Sea, and had all easterly winds and very *clear* weather. The wind was light, it is true, but yet always fair until arriving at Timor, as I watered at Coepang. From Timor the winds were mostly westerly and cloudy, and yet although it was the end of December, I had often spirts of wind from S.E. and S., and arrived at Sourabaya on the thirty-fifth day out from Sweer's Island.

During this last voyage while I was going very comfortably through, all fine weather, other vessels were having it very bad. In endeavouring to get round the Leeuwin, one vessel bound for Batavia was out a whole month, and was forced to put back. Another well appointed brig sailed from Adelaide, September 23rd, was thirty-nine days before rounding the Leeuwin, and sixty-seven days to Batavia. This vessel had very bad weather *all the time*, and by the shipping reports for October, that month appears to have been characterised by bad weather throughout.

I wish, sir, to point out here, and make seamen understand, that vessels can go to India, via Torres Strait, a whole month or six weeks later than the time usually specified by underwriters, etc. Surely there ought not to be much hesitation about the *fine passage or the rough;* the only difference is that insurance for one is high, but I believe that this is saved by less wear and tear alone, than that which ships would certainly have to put up with in the southern passage. And another thing may be observed: by the Straits route a ship arrives in India in first rate order, rigging and sails all good and not weather worn. In fact, all on board looking A 1, better than coming in as some do, with half their sails blown away, and vessels perfect wrecks. I believe that nearly all shipmasters would prefer taking the Straits route, to that of Cape Leeuwin, but are deterred by reports such as I have mentioned above, of thick weather, etc.

Although our knowledge of Torres Straits and its vicinity, has been greatly extended of late years, still I believe that there is a great deal to be found out yet, and very much to be discovered, especially with respect to winds, etc. The day before I sailed from Batavia for this place, Sydney, December 24th, 1867, a small vessel also left bound for Sydney. Captain G. purposed going via Torres Strait, or the eastern route as it is called. I shall endeavour if possible to get all the information I can from him, and if I obtain any, will forward an account to you, as I think all the information we can glean about this passage, is more or less valuable, and might in the future have some influence with vessels bound to the East coast of Australia. And may I add that, shipmasters would do well if they would only make their experiences a little more public. Individually one certainly may not be able to say a great deal, but when *each one* says a *little*, I think the aggregate would show a mass of very valuable information.

On the 12th October, 1867, at 4 a.m., I was told by the chief mate that he had just passed a *heavy break*. His attention was first drawn to it by a confused noise, and an odd, unsettled appearance about the ship, and on looking over the weather quarter (steering N.N.W., wind east), he distinctly saw heavy breakers! he counted three distinct breaks. They appeared to be over a small patch, and when, some few minutes afterwards, I came on deck it was out of sight. The water was quite smooth, weather clear, wind east, ship going five knots. I was surprised, as my charts, latest Admiralty sheet, 1866, had nothing down in the way. But on reference to several epitomes and charts, I found Young's Reef mentioned as nearest this locality, although no two charts or tables agreed together as to its position. Star latitude found at the time placed the break in 17° 38′ S. lat., and long. 154° 43′ E., I found the chronometer very correct at Bramble Cay and Booby Isle, etc., so I conclude this position to be nearly correct.

Although I dislike very much to raise doubts about dangers, unless really examined and proved to be so, still I deem it my duty to report this; for there *was a break* there can be no doubt. But by what caused? "There's the rub." I can only say, I recommend great caution and an extra look out by all who may be passing in this vicinity.

In May, 1866, I left Booby Island, in company with the ship *Westward Ho!* and when about twelve miles from the isle, saw a supposed shoal; the barque being nearer than my vessel to it, kept away southward to clear it. I also kept away, and when alongside each other, we both spoke of it, and felt certain it must be a shoal. It did not appear to have two fathoms water on it. Our soundings gave nine to ten fathoms. However I made up my mind to find out whether it was a shoal or not, at some future time. Accordingly, this last voyage, I left Booby Isle, and steered E. by S. for it. Saw it plainly, hove to, lowered a boat and sounded over it, but found not less than eight fathoms water on it! with a remarkably white sandy bottom, and small white coral on it. Certainly this would deceive any person who first saw it, and most assuredly it would be set down as a

shoal. However, having carefully sounded it, I was quite satisfied as to its character, and that this is no danger. May not this be the reported "Aurora" shoal?

I should like very much to have an opportunity of again seeing the reef or whatever caused the former break, on October 12th, above-mentioned, and, if practicable, really to ascertain what it is, as it is our duty to do. But very often things are passed carelessly by, it being too much trouble to get boat out, etc., or heave to for a short time. Everyone is of course anxious to get on with the voyage, although a delay of an hour or so would often be very beneficial in confirming reports of shoals, etc., or clearing up many doubts!

I cannot close this letter without adding a few remarks about the utter waste and carelessness that is shown with regard to the provisions, at Booby Isle. I landed there, and found casks of water (but lately left there) just at the mouth of the cave, the sun pouring down heat upon them with all its force. Casks of rotten pork, biscuit spoiled, and half-empty cases of all kinds were lying about in the most approved state of disorder. Nearly all the cases were opened, such as preserved meats, etc., and apparently opened for the mere purpose of idle curiosity, not for use, and then left open to spoil. The smell in the cave was truly sickening, sufficient of itself to taint all the good provisions in the cave.

I landed my crew, however, and cleared it out, nailed the cases up, and stowed all the things snugly away at the inner end of it; where I hope they will be allowed to remain for use, and not destroyed merely for the sake of acting the "monkey," and seeing what is inside of them, by those whose duty it should be to *add* to the store. Who knows how soon it may be our own lot, or that of one of those inconsiderate visitors to want the hospitality of the far famed store of Booby Isle. Last year when I was here there were a number of books and pamphlets, papers, etc., but now there is not one left, all are gone; so unless some good Samaritan leaves a few more, poor Jack will have nothing whatever to amuse himself and pass the weary hours which he may have to wile away while waiting for relief. Surely it was a very foolish, wanton act to destroy or take them away. Again it appears that those who find refuge there (and they consist generally of one ship's crew a year) open a cask of beef, bread, etc., and perhaps only use two or three days' allowance out of them, when they are relieved, and then they leave the casks open, of course to spoil. Surely they might head up the ullage casks again, and those who have the command of them should see that this is done. But no: *to them* the matter is quite unimportant, as soon as their turn is served, they care not who may come after them. Such wanton destruction should be severely condemned by every rational seaman, for as I said before, we should add to the store when possible, and not destroy.

Wishing every success to your world renowned Magazine, I beg to remain your willing supporter, J. L. B. Brown.

Sydney, N. S. W.
February 22nd, 1868.
To the Editor, Nautical Magazine.

The sentiments of our correspondent are creditable to him, both as a good Christian and a careful seaman. We trust there are yet many of his stamp afloat to maintain the good character which used to distinguish the British seaman, for it is said times change and that we change with them. In our volume for 1857, pages 314 and 316, will be found Sketches of Booby Isle, and the celebrated post office, which we may again produce for the amusement of our readers. We shall be very glad to hear from Captain Brown about his "*break*" of the 12th of October last; and could wish that such correspondents as himself, our friend at Sourabaya, and Captain Polack of China Sea notoriety in our last number (in which his excellent paper leads the way), were rather more numerous than we have found them of late years.

Another word on Booby Island:—In our volume for 1850 Booby Island is thus alluded to:—"It is a small islet on the western side of Torres Strait, where men of war or other passing vessels occasionally leave a small stock of provisions as a resource for some of the crews of the many wrecks that annually occur in the neighbourhood. I need hardly point out the scanty and precarious nature of such a resource, and how dire must be the disappointment and dreadful the sufferings of a wrecked crew who found the provisions exhausted by a previous set of unfortunates."—To which we may add, how still more severe would that disappointment be when it was seen that those provisions had been wantonly destroyed and rendered unavailable by the capricious acts of inconsiderate visitors—what term would be applied to them? As we shall return to this subject in a future number, we shall be glad in the meantime to learn the latest condition of the cave and its store, page 237.—Ed. *N.M.*

China Sea Navigation—December Hurricane.

A hurricane in the China Sea in the month of December is no common occurrence. Piddington, who has collected an account of them generally in that sea, mentions that in sixty-four years not one had occurred in that month. Hence this of the British schooner *Anne* is important, as it will place shipmasters on their guard, for although the hurricane season seems to terminate in November (and they are very few even then), it will shew that they must be prepared for them a month longer. Whether the master of this vessel was aware of the passage pointed out by Captain Polack in our last, the *Anne* does not seem to have been sufficiently powerful to meet the heavy seas she had to encounter outside the shoals, and therefore bore up for the Palawan route. On the whole, the account of the *Anne* will interest our China Sea navigators generally.

The British schooner *Anne* reports: left Cape St. James on 7th December, with light winds from the Eastward; at 5 p.m. the weather

became cloudy and the wind bearing to the Northward, with an increasing breeze, stowed all small sails. From this date had nothing but strong N.E. gales up to the 16th December.

Finding it impossible to get to the Northward close to the shoals, owing to the heavy N.E. gales and high Northerly sea, at 8 a m., of the same date bore up for the Palawan passage; at noon passed within a mile of the Rob Roy Shoal, which has a very conspicuous beacon upon it. Strong N.E. gales continued up to the 20th, when the wind became light and variable, mostly from S.E., with heavy rain; at noon light airs from the Eastward, set all sail for the first time since the day of leaving the Cape; at 4 p.m. on the 20th, the breeze increasing with cloudy weather and a falling barometer, took in all small sail; at midnight strong gales with much rain, barometer 29·65. On the 21st December strong Easterly gales with heavy rain; at 10 a.m. the wind veered round to S. and S.S.W., with very heavy rain; at 6 p.m. hove the vessel to under closed reefed mainsail till daylight, wind strong from S.S.W. with passing showers.

On 22nd December fresh breezes from S.S.W. with rain at times; at 6 a.m. kept the vessel to N.E. by E. through the Palawan: at 8 a.m. the gale increasing; at 10 a.m. blowing very hard, barometer 29·60; at 11.30 a.m. the barometer still falling, deemed it imprudent to run the vessel any longer not being sure of position, and the vessel evidently running into worse weather; at noon rounded the vessel to under close reefed main sail and fore stay sail, barometer 29·45.

The vessel had not been rounded to more than twenty minutes, when a fearful hurricane of wind with rain struck her, heaving her on her beam ends, top-gallant rail under water, filling the decks, fore and aft, lifting boats and water casks and half filling the forecastle before it could be battened down; the new fore stay-sail split from clew to head. After blowing a complete hurricane for about three quarters of an hour the wind began to ease. Set the close reefed mizen to keep the vessel at the wind. From the time the wind began to ease, until it was breath calm, was about half an hour. In the calm the barometer had fallen to 29·25. The sea breaking on board in all directions, the sea and land birds began to flock on board in great numbers, down in the cabin all over the vessel; they were all quite tame and did not seek to move when you put your hand to them, all seemed to warn us that the worst was to come, and that the vessel was further to the Northward than our supposed position, which was lat. 8° 47′ N., and long. 116° 52′ E.

The calm continued about half an hour, when the wind came away from N.E. with awful fury; before the mizen could be lowered down, it was blown to pieces. The hurricane still increased, the new close reefed main-sail with the throat and peak halyards settled down, which had stood the fury of the S.S.W. wind, blew away before the N.E. wind in tatters or ribbons, the vessel lying on her beam ends. On the opposite tack, the starboard tack, the lee side of the deck, top-gallant rails and all were under water, and all hands holding on to the weather mizen rigging. Fortunately for us the fury of N.E. wind only lasted

about the same time as the S.S.W. wind, when the barometer began to rise and the wind to abate.

Had no observations from the 19th up to the 25th, on which day we had good observations, which would place the vessel when in the centre of the typhoon in about lat. 10° 10′ N. and long. 117° 51′ E., the current having carried the vessel one hundred miles to N.E. by N. from our supposed position, which is about fifteen miles dead to windward per day. Latitude and longitude on the 25th: lat. 10° 25′ N. and long. 117° 58′ E., the vessel having drove nearly up mid-channel; on the 23rd and 24th had strong N.E. winds. On the 28th exchanged signals with the British barque *Labuan*, from Bangkok to Hong Kong; from the 24th had light variable airs as far as the Pratas Shoal, from thence had a fresh monsoon until our arrival in Hong Kong at 11.30 p.m., on the 4th instant.

The British barque *Labuan* reports leaving Bangkok on the 7th October; light airs and calms in the Gulf. On the 25th November, anchored under Cape St. James to repair sails and get provisions and water; on 27th of the same left that place; on the 6th December sighted London South Breakers; on the 21st of the same saw Bombay Shoal, distant five miles N. by E.; at 1 p.m., of the same date, bar. fell to 29·50; strong Easterly gale and hard squalls; at 2.30 shifted to S.E. by S.; bar. 29·47, hard gale and squally with misty sea; midnight hard gale at S.E. and squalls increasing in strength; at 2 a.m. on 22nd furled main-sail; at 4 blowing very hard at E.S.E., in fore sail; at 9 hard gale from E. by S., in fore top-sail: at 10 furious gusts at E. and tremendous sea, hove to under mizen stay-sail; at 2 p.m. bar. 29·44, wind E.N.E., and furious gale and the sea heaped up and very confused; at 6 p.m. bar. rising and the wind moderating, made more sail, and reached Hong Kong on the 5th January.

The Sandwich Islands: *their annexation to America, as viewed by the natives and their Government.*

In one of our recent numbers we inserted a project which was expected to be worked out by a reciprocity treaty between the United States and the Sandwich Islands. We recorded with it our own opinion of the measure generally, as it would appear to affect European states in general; but more especially those of a nautical character. The treaty seems to have originated with certain parties at San Francisco, where it appeared to be looked on as a fine stroke of American policy. This does not however seem to be the light in which it is considered by the *natives* of those islands, for we find the following sensible remarks in the same paper as that in which the treaty originally appeared, and it is to be hoped that the good sense expressed by their own Government will prove sufficient to release them from such a fate. At the same time, it is observed that the

native population is decreasing in number, a feature of the subject in which American annexators will exult, and in consideration of this our European legislators will have to be timely prepared.

The *Commercial Advertiser* of the 14th March last says :—

An editorial in the *Au Okoa* of last week is worthy of a careful perusal by our readers, and we accordingly present a translation of it for the benefit of those who are not familiar with the Hawaiian. It may be remarked that it makes a more sincere, open and heartfelt statement of the case than anything that has heretofore proceeded from the Ministry and their organ :

It is worthy and right, and it manifests a truly laudable zeal that every patriotic heart should pour forth its whispered love for the land of one's birth and unchanging home; and every true child of the race will always speak affectionately of the country where he has lived in safety, and been tenderly nursed and brought up. Yes, it is our habit, from our ancestors down, to linger lovingly in thought upon the beloved fields, and the hills that we have always admired, and to cherish most carefully all patriotic sentiments. And, as we have said before, the love of country is no creation of man, but an unseen hand has planted this feeling deep in the hearts of the race.

The natives speak thus on the subject :—

In certain newspapers, which we have perused, we have seen expressions of opinion by those who are earnestly desiring to bring about the annexation of this kingdom to one of the great powers. But in directing our somewhat disconnected thoughts to this subject, suspicions have entered our minds that the benefits would not be for the mass of the people but for a few, and so it is doubtless true that these few are aiming to a high position; and when they attain to that height, then, who will have anything to say? Time will show, however.

We are a race concerning whom all sorts of evil has been prophecied; that in a few more years we should cease to exist, and strangers would occupy our soil. Let not, however, our steadfast thought be disturbed, by these false prophecies, but let us turn toward the heavens which will bring to nought these ill-boding prognostications. Fear, moreover, is a very poor comforter and sustainer.

It would appear from the papers of the neighbouring coast, that especial attention is now directed to us. One paper states the case thus: "Neither the chiefs nor the people can realize how great are the benefits that would accrue to them if this kingdom were to be annexed to some foreign nation." It may be very true that, as is said, our State would be improved, should we fall into the hands of a foreign power; our neglected fields be furrowed by the fertilizing plough,—our little town spread forth into a large city; we should have representatives who should speak for us in the legislative assemblies of the nation we choose as our bosom friend; and our commercial prosperity might be greatly increased. But, on the other hand, do we expect that, after we have thus become one with a foreign power, we shall continue to hold our heads as high as in the days of our ancestors?

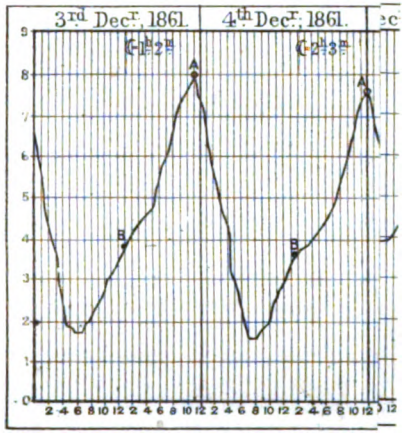
Will we not bow meekly as we go? And shall our BELOVED SOVEREIGN be allowed to become a mere object of disrespectful curiosity to them (the foreigners)?

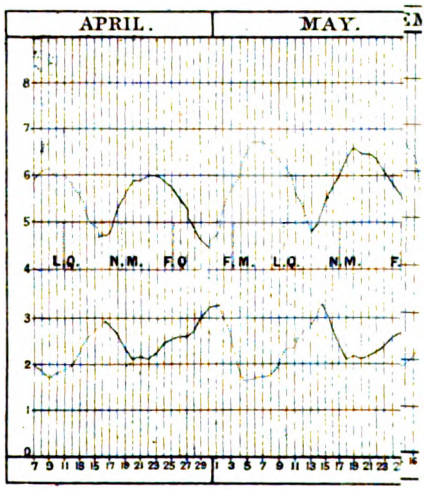
It may be very true that we shall receive benefits from without; but what will be the feelings that will be stirred up in every truly patriotic heart? We may receive temporary benefit, but what in the end? Let us remember there is a sequel to all our undertakings and plans,—a future that depends upon our efforts. Now some papers say our islands are not of much consequence, being so remote from their circle of influence. But we say these are most important resting places,—situated as we are, far out in the midst of the greatest ocean of the world.

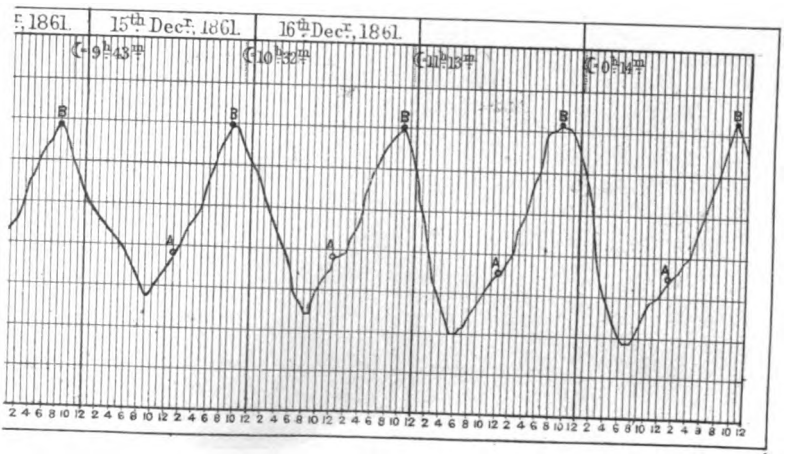
Here, however, is the great question: Have not the rights and privileges of the nations that have been on friendly terms with us been duly respected? We say, without occasion for blushing, that we have cared for their rights,—in fact have taken especial pains in this direction; and in looking at the conflicting interests of the present time, there seems to be hardly a kingdom that has been so scrupulous in attention to strangers as our own. Untiringly have we regarded the rights of nations who have made treaties with us—and, more than this, of those who have not made such treaties. Equal privileges to all, and even more than this. And why then are a certain party talking so loudly in favour of annexation? Have we indeed been so at fault in our dealings with those of other nations? Have we been feeding them with poison?

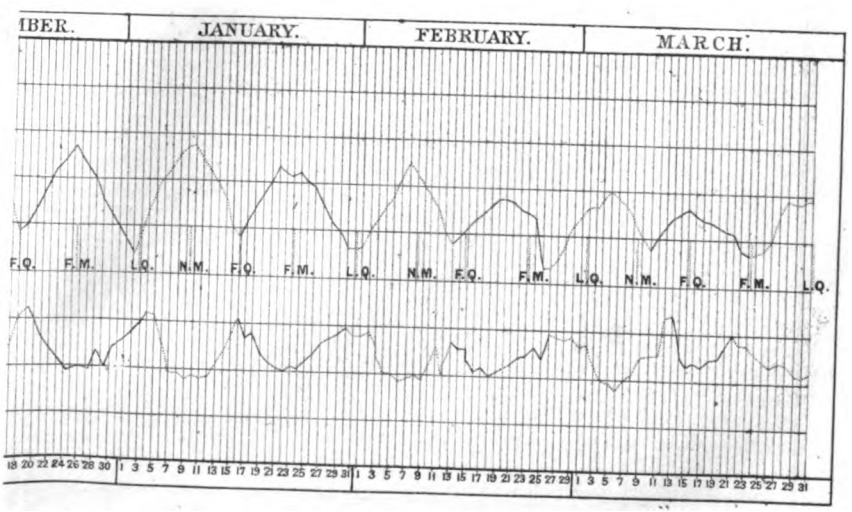
A certain paper in this place expresses the opinion that America does not care much for this country, because we are so remote. *Indeed!* Very true perhaps that America, as a Government, does not desire annexation, but her young sprigs are stirring up the subject, and by their perpetual agitation of the matter, the attention of the Government will be turned this way with sinister intent. For the progress of all nations is westward, especially at the present time. In past centuries the powers of the East have migrated into Rome and all Europe—in later time to the Continent of America and the United States, with whom we now live on friendly terms. The kingdoms of the East have grown to full size, and diminished again to their present medium place on the scale. So the United States is now ascending to its highest point of power, to which indeed it has arrived. The lesson of the time is that the progress of empire is westward. And now the lines of steamships are going to and fro between the golden shores of California, and the shores of the "flowery land" of Asia. And we see a result of this movement in that the Emperor of China has sent an American Commissioner (Burlinghame) to re-arrange the treaties.

Thus the bands are loosed, that the western regions may rise in prosperity. The day-dreams that some have indulged in, they are endeavouring to realize, by turning hither their plans and their hopes —to these western islands. Thus turning to the west, undoubtedly some are endeavouring to obtain a foot-hold here in this great ocean, and as we stand at the important centre, so their glances are directed









to us here. It is certainly so, and it is a most barefaced denial, and utterly unsupported—this assertion of some that there is no plan of this sort.

And if our kingdom is thus annexed, thinkest thou, child of Keawe (Hawaii), that you are to obtain the blessings that others would make thee dream of? Thinkest thou, offspring of Kama (Maui), that thou hast a sure foundation to stand upon? Are you willing, O Kakuihewa (Oahu), that your SACRED SOVEREIGN shall become a laughing stock, and the object of impertinent curiosity to the traveller from who knows where? And thou land that takest away the sun (at night, Kauai), lovest thou not thy steep heights and deep shady valleys? We know full well it is no peaceful cry that comes from the four winds concerning the annexation of our country; and we believe that for a man to be ashamed of his fatherland, is the last thing he should be permitted to do, ere he closes his life.

ON THE TIDES OF THE PHILIPPINE ISLANDS. WITH A CHART.

By Senor Don Francisco Carrasco.

IF the local features of different places on the surface of the globe exert a powerful influence on the phenomena of the tides; if the winds, and atmospheric pressure, modify the laws which regulate them at any particular place; and if these laws be deduced from those observations, obtained during a period of years, it may be imagined how difficult it is to establish such laws which have to be drawn up for places, which by their position and exposure to atmospherical phenomena, are deficient of the elements necessary for the foundation of those operations which are essential for the determination of those laws. Such were the ideas which occurred to the author of these lines on first undertaking the consideration of the tides in the bay of Manila.

The Philippine archipelago being the barrier which separates the Pacific Ocean from the China Sea, but allowing of free intercommunication, their tides undergo remarkable perturbations, which almost entirely modify the general formula established by Bernouilli. In order to substantiate such an assertion let us refer to the tidal observations of Japan, and those of the gulf of Tonquin: while the former follow the general principle established by that celebrated mathematician, as shewn by the observations made at Yeddo and Yokohama by the officers of the Danish frigate *Arcona* in 1860, the latter are so peculiar, that they have attracted the special attention of all the officers who have visited that coast.

The observations of this kind recently carried on in the Philippine archipelago, and especially in the bay of Manila have been made for a short period or for a special object: and thus it is that nothing has

been found on this subject in the hydrographic notices of these parts; on the contrary, the pilots of the coast, the foremen of the dockyards, and the natives generally all declare that the tides about the islands are downright mad.

Without contenting ourselves with this idea, we must admit that there are serious discordances in the scanty isolated data before us. They do not enable us to find any relation to each other in the tides of consecutive days, nor between those of different seasons. Fortunately the soundings of Manila Bay made in 1861, with the view of rectifying the chart, have supplied us with sufficient elements to confirm our first impression on the subject.

Having to reduce these soundings to the lowest level of low water springs, fortunately we succeeded in forming for the position of Manila lighthouse (where there is no influence from the river Pasig), a means of indicating the rise of tide in the Bay. As the operation of sounding occupied two months precisely, during this same time the level of the water was observed every half hour, from which a curve was formed with the data thus obtained. And it was with agreeable surprise that a connection was discovered from which a law might readily be deduced, the first results of which were published in the Hydrographic Annual of 1863, p. 166.

This first step being secured, some tidal stations were established and among them those of the island Corregidor yielded the necessary elements from half-hourly consecutive observations extending throughout a year, that enabled us to draw up this paper. The confirmation from two years of observations at the arsenal of Cavite of the principles we have established, and observations at other points of the archipelago confirming the laws which we deduced, encouraged us to publish these first conclusions. If as we hope hereafter to do, we may be enabled to compare simultaneous observations at particular places in the islands with each other; we shall become acquainted with the set and velocity of the currents, the daily effects of lunar action, and in fact they will afford a complete study of the tidal streams in the interior channels of this archipelago.

Having stated that for such an investigation as we here propose we depend on the half-hourly register of the tide, extending throughout a whole year at the station in the island of Corregidor (entrance of Manila Bay), and as our object is simply to shew the results deduced from them, we may be permitted to enter rather fully into details so as to facilitate the object we have in view.

The first task that we imposed on ourselves was to trace the diurnal line of the tide: we constructed a chart on which the ordinates represent the hours of the day marked at the upper part of it, and the abscissas the vertical rise and fall in feet, etc. The height of the tide being marked on this chart at the hour of its occurrence, and drawing a line through these points we had a representation of the state of the tide during the observations. When considering this curve on which we have also marked very carefully the passage of the moon over the meridian of the observer, it was easy to trace the relation.

of the tide, in reference to the position of the moon. And from this consideration it is evident, that at the Philippine archipelago there are in fact three classes of tide: viz., daily, monthly, and annual.

In order to shew the monthly tide we have constructed another chart of the same description as the former, with the difference that the ordinates represent the greater and lesser rise of the tide in the same lunar day. We also traced a line by uniting the points, marking the heights, making a curve which shews its daily progress during the observations. This we have called No. 2.

The very few extreme tides which occur in a year's observations, do not require another chart; since to pursue the study of the annual tides, it is only necessary to consider the highest tides at the solstices and equinoxes.

The Daily Tide.

The daily tides, or shall we call them, the highest and lowest state of the tide in every lunar day, vary much at the place of observation, as well in the apparent number, as in the height of the tide. Thus, looking into chart No. 1, we perceive days in which only one sensible high water occurs, and a corresponding low water; while in others we find two high waters and two low waters. Nor do the high waters correspond to the moon's passage over the meridian; for some times they are before the moon's transit, and at other times the high waters are after it.

If we leave this diurnal comparison and follow the curve during the lunar month, we see that at the beginning of the lunation there is a high water of great comparative importance; and another most minute one, corresponding to the passage of the moon over the inferior meridian (antipodes). The important high water goes on decreasing in height with the age of the moon, and the small one increasing until near the first quarter of the moon, when the heights of both high waters are nearly equal: the first goes on decreasing and the second increasing until full moon when the great tide of new moon is converted into the least and this into the largest. Starting from this conclusion, the same phenomenon presents itself in the large tide diminishing, and the smaller one increasing, so as to become equal at the last quarter, and at the next new moon returning to its former greater height and the other to its lesser. From thence it was established:—

1. That in the Bay of Manila in the course of the lunar day, there are two high waters and two low waters of different relative heights: and

2. That the difference between the heights of the two high waters has reference to the age of the moon.

In the diurnal tide when there is only one sensible high water, the tide rises slowly up to its greatest height: at this height it stops for some time, and these fall with tolerable rapidity to low water; this ebb occupying from nine to ten hours, an interval of time that gradually decreases to six hours on approaching the quarterings of the

moon; and having two high waters of a minor description than those of the Syzygies. (Full and change).

The inspection of chart No. 1 demonstrates what we have said. The tide marked by A goes on decreasing from two days after the new moon, to be equal, at two days after the first quarter, to that marked by B: the first goes on decreasing until it is nearly lost in the full moon. On the contrary the B tide, insignificant at the new moon, increases every day until it is equal at the quartering to that of A, and continues increasing to become the highest at full moon.

We may see this by the following table:—

New Moon on 2nd December.			First Quarter on 9th December.							Full Moon on 17th December.						
Days of the month ...	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	F. in.	F. in	F. in.	F. in.	F. in.	F. in.	F. in.	F. in	F. in.	F. in	F. in.	F. in	F. in.	F. in.	F. in.	F. in.
Height of the B tide	3 8	3 9	3 7	3 10	3 11	4 0	4 8	5 6	5 5	5 10	6 2	6 8	6 10	7 0	7 2	7 1
Height of the A tide	8 0	8 0	7 8	7 3		7 0	6 7	6 3	5 5	4 11	5 10	3 10	3 10	3 9	3 10	3 5

In this table it may be seen that the B tide of 3ft. 8in. on the third (or second of the lunation) goes on increasing until it reaches its maximum height on the 17th, that it reaches the height of 7ft. 2in., while the A tide of 8ft. on the first day decreases to 3ft. 5in. on the 18th: that is, that a high tide (A) of 8ft. and another (B) of 3ft. 8in., on the 3rd of the month immediately follow the new moon; two equal tides (B and A) of 5ft. 5in. follow the quadratures (the 11th), and lastly that a (B) high tide of 7ft. 2in., and another (A) of 3ft. 5in. occur near the full moon.

The Monthly Tide.

We have seen that during the lunar month the height of the tide varies with the age of the moon; that is to say, that the high waters which follow each other in the course of the lunation, observe a relative varying height but obeying always a constant law, which is that formed by the monthly tide. If as in the daily tide, we follow consecutively the height of each tide at high water, we shall see that the highest of these which takes place immediately near the new moon gradually diminishes until it becomes nothing at full moon, while the lesser high water of the new moon increases so as to become the greatest at the full moon, and both are the same at the first quartering. The same takes place with this high tide of full moon;—that decreases until it disappears at the following syzygy at the quarters of the moon being equal to the lesser tide of full moon, and this again goes on increasing for the new lunation.

The levels of high water at the high tides of the syzygies of the same lunation are not equal, these different levels depending on the respective positions of the sun and moon. Thus it appears in our

observations, that the great monthly high tide is higher at full moon than that at new moon, and both go on increasing from the first lunation after the vernal equinox until the first moon of the summer solstice, at which time it is at its greatest height: from this epoch it decreases for the autumnal equinox when they are equal. From this period the tide of new moon is higher than that of full moon, and both go on increasing to the winter solstice, when they are at their highest, from which they commence decreasing in height to become equal at the next equinox. Hence it appears—

1. That during the lunar month there are two high tides of different relative heights, the high waters corresponding to the syzygies and the low waters to the quadratures: and

2. That the difference between the heights of high water at the syzygies of the same lunation, depends on the relative position of the sun and moon.

An inspection of Chart No. 2 shews at a glance the effect on the tides of the syzygies or mensual tides. The dotted line of the tide for the month of April corresponds to full moon, and the continuous line to new moon are nearly equal: they both then go on increasing their relative heights but the first being always greater than the second until the month of July, when they began to decrease* in the same way: resulting in the two tides becoming equal as is seen in the month of October. From this period as we have said they increase their height, and with the only difference that the new moon tide becomes the higher until December, when it has attained its greatest development returning to become gradually less, and equal to the other at the next equinox.

Lastly, in the same manner as in the diurnal tides we can verify from the monthly tides what we have said above. In fact, in the following table, the tides of the syzygies that our observations supply, give the height of 6ft. 1in. for the full moon, and 6ft. for the new moon; and go on increasing until attaining their highest in the month of July:* from this time they decrease until September, at which time they give 6ft. 3in. for each tide: they then increase their intensity until December, decreasing from that time until the month of March, when they arrive at their lesser height.

The high waters of the lesser tide shewn in Chart No. 2 by a dotted line, it will be seen correspond to the full moons from March to September, and from this month to the new moons. With respect to the heights of the two tides, which we have traced corresponding to the new moons of September and March, we shall explain them presently.

* On the 28th of August, when the tide rose three-fourths of a foot higher than the corresponding, it was occasioned by a typhoon which prevailed in Manila Bay, that began at N.W. and shifted round by West to S.W., its greatest strength being from S.W. and W.S.W. from 6 to 9 a.m., the exact time of high water of that day. The barometer fell 0·42in. below its ordinary height in the S.W. monsoon.

Height of the Tide at the High Waters of the Syzygies.

Months ...	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Ft. in.	Ft. in.	Ft. in	Ft. in.	Ft. in	Ft. in.	Ft. in.	Ft. in	Ft. in.	Ft. in	Ft. in.	Ft. in.
Full Moon	6 1	6 8	7 3	7 5	7 8*	6 3	6 7	6 8	6 8	6 3	5 8	5 10
New Moon	6 0	6 5	6 8	6 6	6 9	6 3 *a* 6 7 *p*	6 6	6 10	7 3	6 8	6 6	5 11 *a* 5 7 *p*
		Full Moon		7 3								
		New Moon		,, ,,								

* This is the high water alluded to in the former note.

The Annual Tide.

We have already said in explaining the monthly tides, that the annual movement of the tide in which its curve is seen is traced in Chart No. 2: shewing—

1. Two tides, each of six months' duration in which the high waters correspond with the solstices, and the low waters with the equinoxes.
2. The difference in the height of the tides at the solstices and the equinoxes depends on the positions of the sun and moon in their respective orbits.

This can be easily proved by only taking from the foregoing table the data necessary to form the other equivalent, and noting in it the greatest high waters at the equinoxes and solstices.

Height of the waters at the Annual Tides.

	Ft.	in.
At the Vernal Equinox	6	1
,, Summer Solstice	7	8
,, Autumnal Equinox	6	3
,, Winter Solstice	7	3
,, Vernal Equinox	5	11

Difference in height of the High Waters.

In the course of the observations made at the Island of Corregidor, the difference found between the heights of high waters have only been as follows:—

The Diurnal Tide.—From 5 to 8 inches between the tides of the syzygies and the quadratures at the equinoxes.

The Diurnal Tide.—From 2 feet 3 inches to 2ft. 7in., between the same at the solstices.

Mensual Tide.—From 0 to 2 inches between the greatest tides at the syzygies of the same lunation at the equinox.

Mensual Tide.—From 8 to 11 inches between the highest tides of the lunation at the solstices.

That found between syzygies of the intermediate lunation is comprehended between these limits.

Annual Tide.—From 2 inches between the tides of both solstices.
„ From 3 to 4 inches between the same at the equinoxes.

The greatest difference of level between high and low water has been 9 inches at the equinoxes, and 5ft. 7in. at the solstices.

Mean level.—This has fluctuated in the different semilunations of the year between 3ft. 10in. and 4ft. 7½in., giving a mean of 4ft. 3·6in. in the scale of the tide guage.

The mean level is found with high and low water of the syzygy by the tide guage, that is, a' being the greatest height, and a the height at lowest tide.

The mean level $= \frac{a + a'}{2}$.

Actual rise and fall.—This is found as in the case of the mean level, the highest tide corresponding to the proximity of the solstice, and the lesser to that of the equinox. The mean gives 2ft. 4·22in.

The actual rise (x) is determined by the formula $x = \frac{a + a' - 2a''}{4f.}$ in which a and a' represent the two highest consecutive tides, a'' the intermediate low water, and f. the factor, which the Nautical Almanack gives for each syzygy.

Hour of the day when the greater High water occurs.

Hitherto we have only treated on the tides to shew the relation between them and the results which we have deduced: nevertheless their consideration not only has led to those results but also to deduce from them the utmost benefit to navigation, and therefore with that object before us we pursue our enquiry into those results. They shew that a second smaller, perhaps insignificant high water, which occurs near the syzygies, is not at first sight recognized, nor has it any application to navigation: therefore without reference to it we shall now only turn our attention to the great diurnal high water, or where there are two high waters in the day nearly equal to the greater of these.

If we carefully examine the curve of the daily tide in reference to the moon's passage over the meridian of the observer, we shall readily perceive that during the S.W. monsoon, or in the summer, the highest tides happen during the course of the day; while in the N.E. monsoon, or in the winter, they occur during the night. If we would know how this change is produced, we have nothing to do but to refer to the *Extract from the observations*, and we shall immediately perceive, that, the first change from the evening to the morning * tide is shewn by our observations at 8 h. 45 m. a.m., while the second change is shewn at 8 h. 30 m., the third at 7 h. 45 m., etc. But to

* It is easily seen keeping this change in mind, how the hour of high water goes on delaying; one takes place when the hour of the morning tide comes to be greater than that of the afternoon of that day; and now we have only to attend to the greater tide of the day in which we observe the change of hour.

illustrate this change more clearly we have constructed the following table :—

In the S.W. Monsoon.				In the N.E. Monsoon.			
Changes.	Dates of Changes.	Hour of Changes.	Height of High Water on day of Change.	Changes.	Dates of Changes.	Hour of Changes.	Height of High Water on day of Change.
		h.m.	Ft. In.			h.m.	Ft. In.
1	April 17	8.45 m.	4 9·5	14	October 12	9.45 n.	5 5
2	May 1	8.30	4 10	15	,, 25	9.15	5 4·5
3	,, 14	7.45	5 0	16	November 7	8.45	5 0
4	,, 28	6.45	4 11·5	17	,, 21	7.48 e.	5 4
5	June 10	6.15	4 10	18	December 5	6.15	4 9
6	,, 25	5.45	4 10	19	,, 19	5.45	5 0
7	July 9	5.15	5 1	20	January 2	5.45	4 4
8	,, 23	3.15	4 10	21	,, 10	3.45	4 10
9	August 5	2.15	5 5	22	,, 31	1.45	4 6
10	,, 21	1.45	5 6	23	February 13	2.15	4 9
11	September 2	1.15	5 5	24	,, 25	11.15 m.	4 2
12	,, 17	0.45	5 9	25	March 10	0.15	4 8
13	,, 29	11.45 n.	5 7	26	,, 24	10.45	4 8·5

In the foregoing table we see, that, in the course of the year the changes go on progressively accelerating until they gain a day; and in this manner similar phenomena occur in the ensuing year.

In the same manner we can construct another table of the hours when the high waters of the greatest tides occur in the several months of the year.

S.W. Monsoon.			N.E. Monsoon.		
Months.	Times of High water.	Mean height of the tide above the mean level.	Months.	Times of High water.	Mean height of the tide above the mean level.
		Ft. in.			Ft. in.
April ...	From Noon to 1½* p.m.	1 9·1	October ...	From 11½ to 12½ night	2 4·4
May ...	,, 11 to noon.	2 3·1	November	,, 10½ to 11½	2 5·4
June ...	,, 10½ to 11½	2 6·4	December	,, 9 to 10½	2 5·9
July ...	,, 9½ to 10½	2 9·5	January...	,, 7½ to 9	2 2·4
August...	,, 8½ to 9½	2 7·4	February	,, 7 to 9	1 9·9
Sept. ...	,, 5½ to 6½	2 1·4	March ...	,, 2 to 3 p.m.	1 6·1*

The reason of high water happening in one monsoon during the day, while in the other it occurs during night, is, that the moon's declina-

* The height of the tide in the N.E. monsoon, it will be seen, does not reach that of the equal syzygies in the S.W. monsoon. Besides other leading causes which there may be, it must be observed, that, the N.E. winds and the strong land winds of winter blow out of the bay with considerable strength, and consequently prevent the tide from attaining the height it would do were it not for them.

tion being nearly equal and of distinct kind with reference to the corresponding phases of the moon in both monsoons, it is natural that the effects should also be opposite.

With respect to the gradual change of the tide from one half lunation to the next former it is easily explained by the moon's declination, for it should always pass the equator, and as the change will correspond with the change of the time of passing the meridian on the same day it is easy to see that this passing goes on accelerating (for the orbit of the moon keeps the same position disregarding the change): for instance, if we take two successive lunations, that corresponding to the equinox and the following, we shall see that in the first the moon will be on the equator at the syzygies, and will therefore pass the meridian respectively at noon and midnight: but in the second as the sun has changed and increased his declination, the moon will be on the equator before the syzygies occur and the change will be effected previously. Thus each year should have two changes more than semilunations as really does take place.

It will also be observed that to these same changes the lesser heights correspond to the high waters of the semilunation; and allowing for some small alteration owing doubtless to special causes, it will be seen that an order follows in their absolute height and inverted in the same syzygies of the two distinct monsoons.

Establishment of the Port.

There are two kinds of establishments of the port which we have to analyze in our tidal observations, one is *mensual* and the other *annual*.

Variation of the mensual establishment. This which means the alteration which the establishment undergoes, in the different days of the lunation, is subject to the ordinary causes of locality; as for instance, the strength of the prevailing wind and that of the tidal current at springs, etc., etc., which never remains constant and equal for every day; although it is found that when the tide is powerful the establishment is then nearly always the same. Thus at the time of the syzygies we may always tell to nearly a minute, the time of high water; while at the quadratures the errors are much greater. In fact it is certain that the course of the tide at this period of the moon places precision out of the question as to the time of high water.

As the spring tide of the new moon, which is that next after the moon, passes the meridian it diminishes to nothing at full moon, and the contrary takes place with the minimum of the new moon; it follows, that, in order to determine the time of high water, two establishments of the port must be used, one of + 9 h. 56 m., and other of — 2 h. 21 m. (the mean of those found by our observations;) keeping before us, that, if one takes the negative sign, that is, the high water is accelerated as the moon passes the upper meridian, it is to avoid the assuming of an establishment equal to the difference of the negative to twenty-four hours, and which would be done to find the time of high water on any required days, it would be necessary to find

the time of the moon's passing the meridian two days before the day on which it is desired to find the height of high water.

The annual variation. This variation which signifies the alteration of the two establishments of the port in the course of the whole lunation is such that with the stations they completely change their sign. Thus, if we analyze the *Extract from the observations* we shall see that in the S.W. or summer monsoon, the establishment of the port is + 9 h. 56 m. from the proximity of the last quarter of the moon until the first quarter of the next lunation; and — 2 h. 21 m. from that epoch to the proximity of the last quarter of the same lunation. In the N.E. monsoon or winter the reverse takes place; the establishment has the negative sign from the proximity of the last quarter to that of the first of the succeeding moon, and positive from this date to that of the last quarter.

However it is clear that if we wish to verify the times of high water of the same day we have only to apply the two establishments, and by this means we shall find the two hours of high water, the heights of which as we have already said will be in relation to the season and the age of the moon.

To show more completely the manner in which this change of establishment is effected, we have only to form the following table analogous to that of the hour of the change of the tides.

Establishment with the Positive Sign +			Establishment with the Negative Sign —		
Changes.	Dates.	Age of the Moon.	Changes.	Dates.	Age of the Moon.
2	May 1 ...	13·3	1	April 17 ...	28·4
4	,, 28 ...	11·3	3	May 14 ...	26·3
6	June 25 ...	9·0	5	June 10 ...	24·3
8	July 23 ...	6·4	7	July 9 ...	23·0
10	August 21 ...	6·8	9	August 5 ...	19·4
12	September 17 ...	4·2	11	September 2 ...	18·8
14	October 12 ...	29·2	13	,, 29 ...	16·2
16	November 7 ...	24·9	15	October 25 ...	11·9
18	December 5 ...	24·3	17	November 21 ...	9·3
20	January 2 ...	21·8	19	December 19 ...	8·8
22	,, 31 ...	21·3	21	January 16 ...	6·3
24	February 25 ...	16·3	23	February 13 ...	4·9
26	March 24 ...	15·5	25	March 10 ...	1·5

By this table we see that the change of signs of the establishment being accelerated each lunation, the time arrives when with the power of both monsoons, at the solstices they have distinct signs for similar syzygies of the moon.

Keeping this table before us we can always with sufficient accuracy find the exact time of the greatest high water, as it is only necessary to have the age of the moon when we require the time of the tide in the desired month, and apply the establishment of the port, positive or negative as noted in the column, not regarding the date of the month given in the table, as this only avails for the year of our observations.

We have another means of knowing the class of the establishment

to be applied to the hour of the moon's transit to find the high water required. If it be kept in mind that the phenomenon of the tides in this locality have a retardation of nearly three days, or what is the same thing, that the attraction of the moon is not sensible until three days after exerting her power, and besides that the change of the tides from evening to morning, or vice versa, and consequently the change of the signs of the establishment, happen after the moon crosses the equator, we shall have thus an exact means of knowing the sign and the value of the establishment which we want for a given day. In fact, if we have before us the above table, we shall see in the almanack, that three days before the dates of the change, the moon has passed the equator, or what is the same thing, when her declination is nothing. Thus we are enabled to find the following expression to be applied to the establishment for calculating the great diurnal tide in the bay of Manila.

Establishment of the Port.—This has the positive sign from nearly three days after the moon's passing the equator from the northern to the southern hemisphere, until three days after its passing from the southern to the northern. It has the negative sign from three days nearly after passing from the southern to the northern hemisphere until three days from its passing from the northern to the southern. The little difference which may be observed in this time, depends on the respective positions of the sun and moon, the errors being in excess of three days at the solstices, and in defect of three days at the equinoxes.

Lunation intervals.* — For the same reason as above for the establishment of the port, the *Lunation intervals* vary, or the difference between the times of the moon's passing the meridian of the observer, and that where the corresponding high water takes place, having different signs at the same phases of the moon during the monsoon in which they occur.

Differences between the establishments of the port.—The daily difference between the establishments of the port are not equal; that is to say, the retardation of the hours of high water on two consecutive days is not the same as any two other consecutive days being greater or less on consecutive days; but as this may arise from special circumstances, particularly in the strength of the current in tides, more or less, near the springs, and the limits in which they are included are from + 1h. 15m. to — 1h. 15m. in the course of the lunation, they may be dispensed with by the practical navigator, and with the greater reason that these errors, great or small, happen when the tide is of little importance.

Age of the Tide.

The age of the tide, or rather the interval of time between the time of the syzygy and the highest tide corresponding to that semilunation is in connection with the age of the monsoon, as may be seen by the

* Lunar-tidal.

following table, derived from the data of the analysis of the tides At the equinoxes it has the greatest positive age, and this goes on diminishing to zero at the solstices: from this epoch it becomes negatively larger until the next equinox when it attains its greatest age. Every week meanwhile measuring a period of seven to eight days, or the duration of a quarter of the moon.

S.W. Monsoon.				N.E. Monsoon.			
Phase.	Dates of the Phases.	Dates of the High Water.	Age of the Tide.	Phase.	Dates of the Phases.	Dates of the High Water.	Age of the Tide.
Full	April 3	April 8	+ 5·75	New	October 13	October 17	+ 3·9
New	,, 17	,, 22	+ 4·70	Full	,, 27	,, 29	+ 2·9
Full	May 3	May 6	+ 3·23	New	November 11	November 14	+ 3·5
New	,, 17	,, 19	+ 2·09	Full	,, 25	,, 26	+ 0·3
Full	June 1	June 4	+ 2·86	New	December 11	December 12	+ 1·3
New	,, 16	,, 18	+ 2·49	Full	,, 25	,, 25	+ 0·5
Full	July 1	July 3	+ 2·04	New	January 9	January 10	+ 1·25
New	,, 15	,, 17	+ 1·86	Full	,, 23	,, 21	— 1·45
Full	,, 30	,, 31	+ 1·24	New	February 8	February 7	— 1·20
New	August 14	August 13	— 1·0	Full	,, 29	,, 20	— 2·20
Full	,, 28	,, 27	— 1·24	New	March 8	March 5	— 2·70
New	September 12	September 9	— 3·51	Full	,, 23	,, 15	— 3·18
Full	,, 26	,, 24	— 2·62	New		,, 30	+ 6·82
		October 2	+ 5·15				

On examining the curve of the monthly tides, the acceleration which the tide undergoes is very evident. In fact, while in the month of April, the high water of the lunation falls on the 8th, and the full moon on the 3rd, in the month of July, the first occurs on the 31st, and the second on the 30th, that is, the age of the tide has diminished from five days in the first case to one in the second. In the month of August, the high water precedes the full moon of the same month, and so continues to September in which we have two high waters for the same semilunation. A similar phenomenon occurs in the N.E. monsoon.

In the table at the end of the monthly tide we have the same result: that is in the months of September and March, or at the equinoxes, two great tides occur in the same semilunation, one previous to the new moon, the other after it, the result being that in the year there are two tides more than there are semilunations in it.

Lastly, the changes of the sign of the establishment of the port corresponding to the great tides of the two monsoons are explained by only remembering that this new tide which occurs at the equinoxes (by the acceleration which the culminating of the waters keeps preserving) is what modifies the positive or negative sign for each epoch.

During the N.E. monsoon there are two days of each lunation when there is no great tide during the civil day; how then does this go on corresponding with the passage of the moon over the meridian, and the said passage does not occur on two days of the month, nor are these corresponding high waters on days corresponding to them.

This only happens in the N.E. monsoon from the high tides being at night: in the S.W. monsoon, as these occur during the day, there is always a corresponding tide whether it be in the morning or the evening.

Hitherto, we have arrived at these results, but much yet remains to be investigated to obtain a complete insight to the tidal phenomena of the China Sea, by establishing simultaneous stations for observation at Hong Kong or Macao, Cochin China, Singapore and Labuan, to serve as auxiliary to those which are going forward at the Philippine Islands, as well as at the Island of Balabac on the N.E. extreme of Borneo.

FRANCISCO CARRASCO.

Cavite, 1st April, 1864.

[NOTE.—Should the Chart alluded to in the foregoing paper be too late for the present number, it will be found in our next.—ED.]

WHERE IS THE RAIN? AND WHERE IS OUR TOWN SEWAGE?

WHAT has become of the rain? Has the gradual diminution of our woods and forests, or the gradual increase of our railways giving off electricity into our atmosphere dried up the sources of moisture, and kept us receiving unpleasant news from different parts of our parched up land, affecting the plenteousness of our approaching harvest crops. Surely, some scientific soul will tell us. Meanwhile, we find our old friend the *Daily News*, throwing some light on the subject, and hinting at another evil to which an old valued correspondent is calling our attention. But in both essays, water, its absence and its loss by downright pollution, is the burthen of the remarks, and verily, that is a most important one. We do hope that our Commissioners who are charged with enquiry into these subjects will not delay their report to its completion, but send it forth piecemeal as long as each piece can bear with it some important precaution to be immediately adopted for the sake of an early commencement in the rectifying of huge evils, which "as light comes with day" will surely follow a duration of the present state of these matters.

In a truly philosophical manner, here is the view taken of the first of these subjects by the *Daily News*. A good reply to the latter has been provided for us by an old correspondent to which subject we shall doubtless have to return in another early number.

England was once upon a time the land of streams. The osier and the watercress were almost peculiar to her, the willow was quite a feature in her landscapes, and angling, half consecrated by Izaak Walton, was one of the most popular of her sports. There was scarcely a valley along which some little rivulet did not run, and the broader streams flowing along through wide plains of green and fruitful meadow are still the most charming of her country scenes. Our English poets

are all fond of streams, and have taught us all to like them. One of the sweet country sounds which form the most delightful contrast to the roar of city streets is that of the brook rippling over the pebbles or the river falling over the weir. There is a kind of life in a stream which makes it just the companion of a country solitude which a poet loves and teaches us all to look for. The tide of life along the streets runs dry at night, but the brook or the river runs on day and night with volume only varying as the seasons change. We go to it year after year for rest and holiday, and there it is rushing over the same stones, singing the same lullaby to our cares, and leaping up with the same look of welcome which our own holiday feeling reflected on it at first. No wonder that we come to speak of the stream by a familiar name. It is a friend to us, and we treat it as such. In the hot summer weather it brings a sense of air and coolness. It comes with a story of the hills or the meadows, and smiles with the promise of health and of plenty. A landscape without a stream gives us no invitation to linger. A country retreat, with no river at hand, is robbed of half its beauty, and more than half its restfulness. 'Tis hardly "merry England" where you can neither fish, nor row, nor bathe, nor even lie in the sunshine on the grass and see a stream flow by. The life of the country is gone. The landscape wants something to brighten it. Nature is scarcely herself. Her beauty, like her fruitfulness, is in that union of stillness and motion, of spreading fields and flowing streams, which constitutes the charm of England's landscape and the prolific fruitfulness of the English soil.

This is, however, only one view of the streams of England. Alas, for the contrast between poetry and prose, our rivers and streams have come to have a commercial value on one hand, and a value of social convenience on the other. The flowing stream which bears the poet's fancies away to the infinite, and seems to charm away "the cares that infest the day," will bear away or hide beneath its surface more material things. England is no longer a pastoral country, and she bids fair to become rather a land of sewers than a land of streams. Commerce has transformed her into a land of great cities, of mines and furnaces and manufacturers, of noise and dirt and bustle, and the streams have been everywhere turned to vilest uses. Our rivers have now two sources, one in the country, the other in the town; one the springs in the sides of the hills, the other the sewers from under the streets. In this scorching season the natural source is diminishing by the drought, but the artificial source keeps up an almost unfailing volume. Our chief rivers have no great reservoirs at their head, like the lakes which are the headwaters of the abounding Rhine or the rushing Rhone. They have no huge glaciers to make the summer sun feed them more plentifully than the rains of the winter. The Thames and the Trent depend on the clouds as much as any rivulet of the mountains, though sandstone hills and chalk downs form the gathering ground and reservoir which keeps each river flowing through the driest summer. But even the natural sources of many of our streams are being laid hold of for the supply of city populations, passed into

artificial reservoirs, and then sent into their natural channel on their road towards the sea, with all the abominations of a city's underground life poisoning and defiling them. In many of the manufacturing districts the rivers run with dye-wash and the refuse of factories, instead of water. In the neighbourhood even of the small towns and villages the streams are no longer safe to drink or to bathe in; they are often unsafe even to walk by. Among the very hills of Derbyshire the waters are dangerous; and out in the agricultural plains a slight drought makes the waters ferment, and sometimes poison the air. In this metropolis we are building splendid roads by the river side and keeping our sewage separate from the stream, but only to send it down a few miles lower and discharge it there. Even with us it is only a question of place. We still defile the river, but not by our own doors. All over the country the same thing is still going on. We do the worst thing we can with our refuse, because it is the easiest thing: we deny it to the fields it might fertilise, and throw it into the streams it poisons. We are bringing a worse plague on our rivers than that of Egypt. In this dry season nature is simply refusing to be our scavenger. She denies us the showers which would flush the streams we have turned to sewers, and under this fiery sun she will make us confess our error.

We are glad to see that the Royal Commission appointed in 1865 to inquire into the pollution of rivers is not asleep. The Commissioners have just been heard of at Manchester, where they are now inquiring into the condition of the basins of the Mersey and the Ribble. At Manchester they will see the Irk, the Irwell, and the Medlock flowing like streams of dirty ink, scanty and used up, through one of the densest populations in the world. All through that vastly populous district the streams of Old England have become the sewers of the England of to-day. The Mersey flows in a stream under Warrington bridge, some two hundred million gallons a day, the flow from some seven hundred miles of streams; but not one of those streams flows with natural water; the engines and manufactories are supplied from the canals, and send their refuse into the natural stream, and hence it is a river of sewage, black as the fabled Styx, which flows under Warrington bridge. Yet even this defilement, which is common to nearly the whole of manufacturing England, is not the worst. Very few would bathe in the Mersey, and nobody would drink of it—its defilement strikes the eye. But many of our streams are even worse defiled, but do not show it; the people bathe and are struck with fever, or they drink and die, as East London did of the Lea, and Soho of its pump. Yet all this evil is needless. It can be cured by compelling all alike to do their duty to the streams. It is of no use for one town to cleanse its river if its neighbour farther up still pours its refuse into the stream; nor can one manufacturer be expected to keep his waste and purify it, unless others go to the same trouble and expense. We hope the Royal Commissioners will be ready with their report soon after the new Parliament meets, and that they will have the courage of their principles, and advise Parliament to impose on the whole country

the necessity which has been imposed on Leamington, that of keeping the sewage and refuse out of the rivers. That is the first and only requirement for the rapid discovery of means of utilising that which is so infinitely worse than useless now. The damage done is not incurable. Nature would soon restore the streams to their old purity and beauty if we would leave her to herself; and we might yet rejoice in Old England as a land washed clean in winter by her rains, and well watered and made beautiful in summer by a thousand streams.

WHERE IS OUR TOWN SEWAGE?

To the Editor of the Nautical Magazine.

Sir,—The *Standard*, of the 27th, has a leading article on the present state of the Thames at Barking, and Crossness Point, and as it fully bears out what was stated in the argumentative portion of my letter on the subject of the purification of the Thames, dated October, 1859. And the results of the Metropolitan Board's scheme so vividly depicted by you in reviewing the said letter, and what appeared in your Magazine of that date, that I have thought fit to forward you the article referred to, in case it has not been brought under your notice.

Yours faithfully,

N. HECKFORD.

PEKIN VILLA, ALBERT ROAD,
FOREST LANE, ESSEX.
May 29th, 1868.

THE slow and painful steps by which a nation, wealthy, civilised, and refined, advances towards a condition of simple cleanliness and healthfulness is in remarkable contrast to the rapid progress accomplished in matters seemingly far more difficult and abstruse. We can drive a railway train at forty miles an hour, or send a message to California in half a minute; but when we attempt to drain a town and get rid of its sewage, we blunder over our task as if it demanded a degree of skill exceeding that of WATT and WHEATSTONE. A successful system of town drainage—if ever we live to see it—may be looked upon as a type of the highest order of civilisation. The main drainage works of the Metropolis take rank among the modern wonders of the world; yet it is painfully certain that the sewage of London is by no means effectually disposed of. The fundamental defect consists in repeating the error which has proved fatal in so many instances—that of casting the sewage into a stream. Even if it were cast into the sea, there would be danger. It matters not how large or long the sewers may be, nor how much the cost. The real question at issue is this—what is the final destination of the sewage? The present destination of the London sewage is the Thames, and as long as that is the case we cannot say that London is properly drained. If Mr. BAZALGETTE is

to be allowed to discharge his deluge of sewerage into the Thames at Barking Creek and Crossness Point, it is difficult to understand on what principle the engineers of smaller towns are to be denied the facilities of a similar process.

It is now some time since we directed the attention of the public to the lame and impotent conclusion of the London sewerage system. The evil has since become so patent that a feeling of alarm is beginning to show itself. A peril of no ordinary character is threatening the Metropolis. The shoals of sewage matter in the Thames are interfering with the navigation of the river, and the filthy deposit strewn upon the foreshores only awaits the heat of the summer sun to engender the elements of pestilence. So near is the enemy, that the distance intervening between the sewage mud and some of the most crowded districts of East London is only four miles in a direct line. Thus, to the horrors of semi-starvation may soon be added those of fever or cholera; and if the mischief once shows itself in the east, it is only too sure to work its way to the west. Every day the evil is becoming greater. The sewage banks beneath the surface of the water are growing larger and larger—one vessel has already been stranded on the Stygian shoal—and the mud is accumulating on the shores both above and below the outfalls. Two hundred thousand tons of sewage fall into the river daily from the southern outfall alone. The northern outfall is not yet in full operation, as the northern low-level sewer is not yet complete. But the northern discharge is already enormous. When the whole system, north and south, is in full action, the discharge cannot well be less than half a million tons per day, a quantity continually increasing with the extent of the population. If, therefore, the deposit in the river is already a source of inconvenience and danger, what may be expected a few years hence?

If the general population of London be not already alarmed, those who live near the outfalls are beginning to speak out on the subject. The inhabitants of Barking are sending up a petition to the Home Secretary, setting forth the disastrous circumstances which are in course of development in their locality, and which menace not merely the immediate neighbourhood but London itself. In some places the channel of the river has been reduced in depth from twenty-one feet to ten feet at ebb tide, a loss, therefore, of eleven feet. Banks of solid sewage, six, eight, and ten feet deep, exist within a few hundred yards of the houses of some of the memorialists. "Foreshores, which were formerly hard shingle, are now pestilential mud; and what were formerly valuable fishing grounds are now spawning-beds of fever and cholera." Very shortly after the opening of the northern outfall, the coastguard station, at the mouth of Barking Creek, had to be removed, the former site having become untenable. The port of Barking, which some time ago received vessels of 200 and 250 tons burden, is now closed to all such craft—a result partly attributed to the sewage, which sweeps in an almost undiluted state up the Creek. Ships have to lie farther off, and lighters have to adopt a more circuitous and expensive route. Flounders and shrimps, which formerly abounded in the Creek,

have been driven away, to the great loss of many of the poor people, and bathing has become impossible. The memorial which sets forth these facts is signed by the vicar, churchwardens, medical practitioners, smack owners, barge owners, and other inhabitants of Barking, and the prayer of the petitioners is this—that London and its neighbourhood may enjoy the same protection as other towns, and that application should be made to the High Court of Chancery by the Attorney General for an injunction against the Metropolitan Board of Works, restraining the latter from discharging the sewage of London into the Thames.

This proposed plan may strike the reader as a very summary and serious mode of proceeding. Yet it is precisely what has been done in the case of several large towns, and it cannot be supposed that London is to be exempt from the law simply because it is bigger than any other town in the kingdom. It is true that the Thames is the largest river, and the volume of water is great at the point where the sewage is distributed. But if the river is a big one so is the amount of sewage large; and facts would seem to show that the sewage is decidedly too much for the river. About a year ago the engineer to the Thames Conservators reported that near the northern outfall a space of more than forty acres, and near the southern outfall of about one hundred and twenty acres, of the bed of the river, had been covered by a deposit varying in depth down to seven feet. One peculiar and alarming feature in this phenomenon was the circumstance that the maximum deposit occurred two thousand feet nearer London than the outfall itself. Dr. Letheby analysed the mud, and fully demonstrated its offensive and dangerous character. The attention of the Metropolitan Board was called to these facts, and after considering the subject for five months, they decided that it was the "duty" of the Thames Conservators to remove the nuisance. That is to say, the Metropolitan Board felt itself at liberty to cast acres of filth into the river, which filth was to be removed—*how*, we know not—by the Thames Conservators! Such are the notions entertained by the members of a board constituted for the purpose of draining London on a system which should "dispollute" the Thames, and such is the final result of an expenditure of from four to five millions sterling.

It cannot be supposed that this state of things will be allowed to continue. The Thames Conservators declare the mass of sewage which falls into the river to be so great that they have no funds at their disposal for its removal. On the other hand, the Metropolitan Board coolly reply that they have no legal powers for meddling with the shoals. But this latter plea is obviously bad. The Metropolitan Board may not have power to remove the shoals, but it is their duty not to create them. The Home Secretary, Mr. Gathorne Hardy, being asked by the Board of Conservancy to exercise his legal powers, proposed that the question should be submitted to arbitration. But the Metropolitan Board "were advised not to submit the question to arbitration." Hence the only method for obtaining a decision was to proceed by indictment. This remedy has not yet been adopted, but

its employment seems inevitable. The risk is too great, the evil too serious, to be let alone. We have heard of the success which has attended the utilisation of sewage on the Essex lands. The Metropolitan Board have therefore an alternative quite as much as the smaller towns. Essex has the least rainfall of any county in England, and is therefore well adapted to receive the liquid excreta. A hot, dry summer, when the Thames is most dangerous, is just the time when the Essex farmers and graziers would be most happy to receive the sewage of London. With the principle of sewage utilisation so far advanced, the Metropolitan Board had better avail themselves at once of the only rational expedient for removing the evil now complained of. Until the sewage is kept altogether from the Thames the great work which the Metropolitan Board were commissioned to perform remains unaccomplished, and the immense outlay of money appears devoted to an abortive and misconstructed scheme.

Deterioration of our Merchant Seamen.*

England—that is to say, the United Kingdom of Great Britain and Ireland—is a great, a wealthy, a populous, and a powerful country. But it is likewise essentially a maritime one. If not maritime it would have been nothing; for without that spirit of enterprise, daring, and love of adventure, which has ever characterised its sons, it would probably to this day be occupied by a sparse agricultural population, and, from the time of the Norman Conquest, have been but an appanage to the crown of France.

Providence, however, intended it for greater things; and at a remote period, even long before the islands composing it were separated from the adjoining continent, those vast deposits of the useful metals, and the coal for fusing them, were stored up within its limited shores, which were destined thereafter to work its forges and its looms; to provide its trading and war fleets; and to carry its overflowing population, its manufactures, and its civilization to the remotest parts of our globe.

Such has been our great, because useful, mission; a mission intended not merely to aggrandise ourselves, but to benefit mankind; to promote, not only our own prosperity and happiness, but also add to the welfare of the whole human race.

To the fulfilment of this mission all classes of our countrymen, and especially our manufacturing classes, have contributed, in their several spheres. But of what avail would have been all our mechanical and manufacturing skill and industry, if our ocean carriers and the defenders of our shores, our naval and merchant seamen, had failed us?

* We readily comply with the request in republishing this exposition of a great national evil from the current number of "*The Life-boat*," or Journal of the National Life-boat Institution.

Recognising in them, therefore, as is generally done, a most important, indeed indispensable, part of our working machinery, might it not be expected that we should, as a nation, take at least as much pains to promote the efficiency of that machinery as we do to perfect the steam engines and other contrivances which we make subservient to our use? In fact, might we not expect that our merchant seaman should, as a rule, be a pattern to those of other nations, not only as regards his professional skill, but as an intelligent and respectable man, worthy to represent his country wherever his duties should call him? Alas! that the reality should be so different. Alas! that instead of beholding him with pride, and feeling that in foreign countries our reputation is safe in his hands, we should, on the contrary, so often have to blush for him, not only as a seaman and an Englishman, but as a man: for it is of no use shutting our eyes to the fact that too frequently he is drunken, profligate, and unprincipled, a discredit alike to himself and to his country.

Wherefore is this? What has brought about so sad a state of things? What is its remedy? We cannot conceive that there is anything in the nature of a seafaring life to demoralize; and if not, surely any other causes which tend to the deterioration of our seamen must be remediable, although it may take a long time to eradicate an evil which has been of slow growth.

We will state what we believe to be some of the causes which have made a large portion of our merchant seamen so different from what we could wish them to be; but there may be others that have not occurred to us:—

1. One cause has been, we think, the abolition of compulsory apprenticeship. When every merchant vessel was compelled to carry one or more apprentices, according to her tonnage, all of whom were bound to serve for seven years, a large number of seamen were thus regularly brought up under a course of discipline, and taught their professional duties and habits of obedience from their boyhood. The shipowners of the United Kingdom, in an evil moment, petitioned Parliament to relieve them of this requirement, as of a burden. Their petition was granted: the adult landsman, too old to learn, took the place of the young, improving lad, and now a generation has scarcely passed before we find our homebred seamen disappearing, and our merchant ships half manned by the adult refuse of our seaport towns, and by foreign seamen who have found their way to our shores.*

2. A second cause may be considered to be the want of early and suitable education—a want so general amongst the classes from which our merchant seamen are collected.

3. A third cause is the prevalence of drunkenness—that terribly demoralising habit, that crime which, by depriving a man of his reason,

* The Merchant Shipping Act *authorises* two-thirds of the crews of the British Merchant Ship to be FOREIGNERS! Surely our legislators must have been mesmerized to senselessness when they passed such an Act! to benefit trade at the expense of their *seamen!!* To them belongs all the odium of their present condition.

places him for the time below the level of the beasts of the field; and which, both directly and indirectly, is a fruitful incentive to vice and cause of misery.

4. A fourth cause is the system of discharging seamen the moment their vessels arrive in an English port, and their entering fresh ones at the last moment before sailing; so that, as a general rule, there is a change of crew between every voyage, an owner never becoming acquainted with the men in his employ, or even, perhaps, knowing their names. Accordingly, as might be expected, there is but seldom any sympathy existing between an owner and his men. He insures his vessel well, and concerns himself but little with their welfare, even in providing for their comfort or safety whilst on board her; and they, on the other hand, are perhaps equally indifferent to the due performance of their duty to him.

5. A fifth cause is bad accommodation on shipboard, with consequent discomfort, injury to health, and engendering of dirty habits.

6. Lastly, another fruitful cause is evil association on shore. No sooner has the merchant seaman landed from his vessel at any of our larger ports than he is instantly surrounded by the worst and most depraved characters, both male and female, who obtain a livelihood by preying on him, and encouraging him to indulge his worst propensities. Their first object is to get him into their power, to effect which they advance him money on his pay; and he is often given drugged spirits, or beer, and being thus stupefied, is afterwards robbed at leisure, and not seldom ill-treated also; until, miserable, penniless, and degraded, he is glad to escape from his persecutors, and to seek refuge again on the "briny deep."

Such is too often the melancholy life of the much-vaunted British sailor. Alternate intervals of hard work, with many hardships, and of profligate dissipation, until, after an inglorious and sad career, he is prematurely called away, to account for the use or the abuse of the precious gift of life which a benevolent Providence has bestowed on him.

Again we ask, why must this be? Why should sailors be more dissolute, more improvident, more childishly helpless than other men? What is the remedy?

We answer, that we fear they will continue to be so as long as they continue to be neglected, and to remain under the same evil influences as at present. Also, that under any circumstances comparatively little can be done with the present generation of our merchant sailors; and that, although we may ameliorate their condition and afford them greater opportunities for improvement, yet it must be through the rising generation alone that we can hope to produce any great and permanent change in their character. "Train up a child in the way he should go, and when he is old he will not depart from it," was the teaching of the Jewish sage, and all men from then until now have acknowledged the truthfulness of the precept. We trust then that our legislators will, ere long, awaken to the truth that the present

fallen condition of our merchant seamen is a public discredit and national sin, and they will feel it to be their duty to make serious and earnest efforts to raise them up, and by educating and specially preparing, as far as possible, the new race which shall take their place, to make them the worthy representatives of a great maritime and Christian country.

We will proceed to state some of the remedies which have occurred to us, and not to us only, but to many others who have thought and written on the subject; taking the presumed causes of the evil of which we are treating in the order in which we have already named them:—

1. Apprenticeship.

Formerly every merchant vessel was compelled by law to carry one apprentice to each 100 tons of burden, which apprentices were bound to serve for seven years. A constant supply of seamen, trained from their youth, were thus insured to take the places of those who, from death, loss of health, advance of years, or other causes, were annually lost to the service. In the year 1854, however, the shipowners of the United Kingdom were short-sighted enough to induce Parliament to relieve them of this requirement; and from that date to this the class of seamen who man our merchant ships, has gradually deteriorated. It is still optional with an owner to take apprentices; and the Merchant Shipping Act of 1854 devotes five clauses to the regulation of apprenticeship, more especially with reference to the apprenticing of pauper boys, and directs all shipping masters to facilitate the same. Comparatively few shipowners, however, avail themselves of the permission, nor is it likely that a greater number will voluntarily do so. If, therefore, we would wish to regain the former high character of our Mercantile Marine, by training and educating its members expressly for it, as is done in the Royal Navy, a well-regulated, compulsory apprenticeship must be returned to; but it should be for a less term of years; and it is the opinion of many practical persons interested in our merchant shipping, that it might be so regulated as not to be even at first disadvantageous to our shipowners, whilst it undoubtedly would in time be immensely beneficial to them, by giving them good servants instead of bad ones, and by making their ships a credit to them, instead of their being, too often, a disgrace.

2. The want of early and suitable education.

Allied to the question of apprenticeship is that of early education; and the effect of the two together on the state of our mercantile marine would, in a few years, be magical. The raw material to work on lies also at our doors, and its absorption and working up would be a double advantage, inasmuch as it is at present a source of shame and anxiety to all thinking Englishmen; and, transformed into a body of real British seamen, it would be beheld by them with pleasure and with pride. We allude to the thousands on thousands of neglected boys that live in the streets of our large cities and towns, and who have received the modern designation of "City Arabs." A vast number of

these are, perhaps, simply neglected. The exigencies of their parents' every-day life of toil, or struggle with poverty, and, we fear, as often their pernicious and demoralizing habit of drinking to excess, leave them neither time nor money to look after and to educate their children; whilst a large number of these helpless and much-to-be-pitied little ones are even sent into the streets by their unnatural fathers and mothers to live by begging and stealing.

It is calculated that the drain on our merchant seamen which has to be annually replaced may be roughly taken at about 20,000, a large proportion of which, might, probably, without difficulty be provided from this class of neglected youth alone, the very waifs and strays of our population, at present reared up only to fill our gaols and convict establishments, and to find occupation for our police; but who, if drafted into training and reformatory ships, which have already, on a smaller scale, produced such admirable effects, would be saved from moral perdition, and raised to the position of useful members of society. To no better use could our old wooden frigates and line-of-battle ships be put, than to be stationed as training and reformatory ships at all the ports round our coasts, and to no more legitimate use could all the available balance of the Mercantile Marine Fund be appropriated than to their maintenance.

3. Drunkenness.

We can offer no suggestion for the diminution of this vice, which is by no means confined to our seafaring population; but we may feel sure that, as a more respectable and self-respecting class of men abound in our merchant service, it will become less and less prevalent.

4. Change of crew every voyage.

The general custom in this country is to discharge the crews of vessels in the foreign trade immediately on arrival home, and to engage a fresh crew for the next voyage, the vessel being loaded and unloaded, rigged and refitted, by men termed "lumpers." The shipowner has, therefore, no knowledge of his men, and evince no sympathy for them; and this is made only too painfully evident to them by the miserable accommodation which is provided for them on board their ships, and sometimes by the unseaworthy state in which the latter are sent to sea. We are aware that the principal steam companies and a few large shipowners retain their men in their employ, although they may sometimes be changed from one of their vessels to another, and that when they have good men they will try to keep them; but these instances form the "exception," and not the "general rule."

Without doubt, the more shipowners can fall into the system of retaining their men in their employ, and the more interest they take in them, the better and more attached servants they will find them to be; and we think that any of them really desiring to promote the improvement of their men, would have no great difficulty in doing so, especially those possessing several ships; whilst owners, having only two or three vessels, might associate with others and engage to employ the men in their joint service in preference to others, whenever any of them were available.

5. Bad accommodation on board our merchant ships.

We regard this point as a most important one. For how can we expect men who are housed no better than pigs to acquire habits of cleanliness and decency? And has not cleanliness been represented as ranking next to godliness in its beneficial effects on the characters of men?

The Merchant Shipping Act, section 231, it is true, defines the number of cubic feet of space which shall be appropriated to each man and boy, and states that the apartment in which they are placed shall be "properly caulked, and in all other respects securely and properly constructed and well ventilated;" and further provides "that the said apartment or space shall be kept free from goods and stores;" and subjects the master of any vessel to a penalty not exceeding £10 for every infringement of the law in these respects. Nevertheless, there can be no doubt that the law is in numberless cases inoperative. Accordingly we find in the Report of a Society, formed in 1867, for Improving the Condition of Merchant Seamen,* under the heading of "Accommodation," the following statement:—

"Accommodation for the crew may be found of every description, varying, of course, with different classes of ships; but there is no doubt that even in some large vessels the seamen's quarters are inexcusably bad: deficient in light, ventilation, space, and every sort of comfort; that sometimes the bulk-head is removed to accommodate cargo, and the forecastle thrown open to the hold, and thus in the case of some cargoes, viz., sugar, guano, etc., free entrance is given to most pestilential and foul-smelling vapours. Sometimes cargo and stores are stowed in the forecastle, which is often too crowded, and, from leakage and general filth, frequently quite unfit for habitation. It is by no means uncommon for the only ventilation of the ship's hold to be a hatch opening into the forecastle. Even in well-found and ordered ships the chain cables often work through the forecastle," etc. In the same Report we also find accounts of meetings held by the merchant seamen at Sunderland, and Seaham, in which, amongst other grievances, they bitterly complain of the accommodation space on board merchant ships for the men, "as being insufficient in amount, badly ventilated, in most cases damp and wet from leaks in the upper deck, and always lumbered up with ship's stores,"—evidencing, they state "that the crew is, in these days, exposed to injury by sea water, to which, in days gone by, the owners of ships would not even expose their hemp cables and other ship's stores." We find also in the same publication a Report from Mr. W. Burroughs, Shipwright Surveyor to the Board of Trade, to nearly the same effect, after his officially visiting Sunderland and Seaham, especially to inquire as to the correctness of the statements in memorials of the seamen at those ports to the Government.

6. Evil association on shore.

This evil may appear the most difficult for which to provide a

* Published by Harrison and Sons, 59, Pall Mall, 1867.

remedy, inasmuch as that when a seaman is on shore no one can prevent him from going where he will or doing what he pleases, so long as he does nothing that is illegal. Yet, after all, much might be done without coercion, by simply providing him with the means of escape from his worst enemies, and removing temptations from his path; for in reality he is subjected to a system of terrorism as well as seduction from the moment of his stepping on shore until he again embarks; and he is as much entitled to the protection of the law against the human vultures and sharks who maintain their fulsome, pestiferous existences by preying on his very vitals, as the community in general is from the pick-pockets and other rogues who infest our streets. At present, like the flying-fish, which, in its short flight to escape from its enemies in the deep, is pounced on by the birds of the air, the merchant seaman flies from discomfort, if not misery, on board his ship, into the very clutches of his relentless enemies on the land, from whom he is in a short time only too glad again to escape, even to return to the discomfort of his home afloat. Aware of the systematic spoliation to which our seamen were subjected, the Government of the day introduced six clauses in the Merchant Shipping Act of 1854 for their protection.

Clause 233 pronounces that wages due or accruing to any seaman or apprentice should not be subject to attachment or arrest of any court, and that all payments of wages to them should be valid, notwithstanding any previous sale or assignment of the same; and that no sale or assignment of wages or salvage made prior to its accruing should bind the party making it.

234. That no debt exceeding five shillings incurred after an engagement to serve should be recoverable until that service was completed.

235. That any party demanding of a seaman or apprentice payment for board or lodging beyond the period actually boarded or lodged, should be subject to a penalty not exceeding £10.

236. That any party having possession of money, documents, or effects of any seaman or apprentice, and not returning the same to the owner when required to do so, subject to any deduction justly due, should be liable to a penalty not exceeding £10, and be required to pay the value of the articles to their owner if not returned to him.

237. That any person going on board a vessel without permission of the master, before her arrival in dock or at place of discharge, should be subject to a penalty up to £20.

Clause 238 decrees that any person on board any ship, within twenty-four hours after her arrival at any port in the United Kingdom, soliciting any seaman to become a lodger at the house of any one letting lodgings for hire, or taking out of any such ship any effects of any seaman, except under his personal direction, and with the permission of the master, should be liable to a penalty up to £5.

Nevertheless, the crimps and other harpies, whose business it is to relieve the sailor of his money in the least possible time, effect their object, and, valuable as these restrictions are, other means must be adopted to defeat it.

The "Sailors' Homes," which are now established at all our larger ports, have already done a great deal in this direction, but they are only available to single men, or to married men apart from their families, whilst every effort is made by the proprietors of lodging-houses to entice seamen from them; and, unfortunately, they have not yet been made self-supporting. A most valuable supplement to them is suggested in the Report of the "Society for Improving the Condition of Seamen" in the shape of "Married Sailors' Homes," or "Family Lodging Houses for Married Seamen;" and the importance of the same was strongly urged on that Society by several of its members and correspondents. We think that such institutions, under judicious management and superintendence, would be a great boon to the respectable married seaman, and would induce many men to marry, and give up a reckless life. It has also been recommended that a seamen's institute and recreation ground should be established in the neighbourhood of all "Sailors' Homes," which would be a further advantage.

It has likewise been suggested that special licenses should be granted to board and lodge seamen, such boarding and lodging-houses being under supervision, so that fraud or other misconduct on the part of those keeping them could be visited by withdrawal of the license.

It is also strongly recommended that seamen should be entitled to their pay and wages up to the day of their discharge, and that they should receive their wages, or, at least, a sufficient advance on them, from the master at the time of their discharge, as it is considered that the untold miseries to which they and their families are exposed from the crimping system are mainly attributable to the delay which arises between the discharge of crews and their payment. It has likewise been proposed that there should be a pay-clerk at every shipping-office, in whose presence all seamen should be paid.

Lastly, it is of undoubted importance that every class of persons who have hitherto preyed on sailors should be licensed, even to the porter who conveys his chest ashore, and who at present is generally feed by the crimp and lodging-house keeper, to bring it by persuasion or by force to his own den.

It may seem strange and anomalous to some persons, that a body of men, who have ever shown themselves capable of heroic deeds in their country's defence, and in no way deficient in general intelligence and common sense, should thus require to be guarded and protected and helped, as if they were so many children. We must, however, be content to grapple with facts as we find them; and if circumstances convert men into children, in some things, we must treat them as such.

We have now only to conclude our remarks on this somewhat melancholy but most important subject. We will do so by expressing the hope that not only our legislators, but the whole nation will awake to a sense of the danger, the discredit, and the sin of suffering this numerous and invaluable, yet, in some respects, helpless class of the community to deteriorate from day to day, until they are fast becoming a discredit alike to their country and themselves.

Summary of Proceedings of the Naval Brigade in Abyssinia.

We are glad of the opportunity of recording the very creditable proceedings of the Royal Naval Brigade in the Abyssinian War. The Admiralty has distributed the following despatch from Commander Fellowes, of her Majesty's sloop *Dryad*, commanding the Naval Rocket Brigade in Abyssinia:

Royal Naval Brigade Camp, Marrawah, May 2nd.

As the campaign is now drawing to a close, and the Royal Naval Brigade under my command will ere long be broken up and re-embarked, I avail myself of the opportunity of a halt to report on the general proceedings of the brigade.

The brigade, in compliance with instructions received from Commodore Leopold G. Heath, C.B., landed at Zoolla on the 25th of January, and encamped on the plain. I commenced organizing them immediately, and as soon as mules could be supplied, lost no opportunity of drilling in batteries and exercising firing rockets, and performing field evolutions. The men rapidly acquired a perfect knowledge of the drill and the management of mules, and I was therefore enabled to report the brigade ready to march to the front immediately that the rocket tubes were supplied.

On the 27th of February I received orders from Brigadier-General Stewart, commanding at Zoolla, to proceed to Antalo on the 29th of February, to join the advanced division, with Sir Robert Napier, K.C.B., K.C.S.I., the commander-in-chief. The brigade marched at daylight on the 29th, and consisted of one hundred officers and men (European), two farriers, thirteen grasscutters, three water-carriers, six bearers for sick, one sweeper for hospital, eighty-eight battery mules, fifty-four baggage and provision mules, or their equivalent in camels, eleven officers' horses. three bullocks for carrying water. We carried with us five days' rations for men and animals.

On arrival at Senafé on the 5th of March, I reported myself to Brigadier-General Schneider, commanding, and was ordered by him to complete to seven days' provisions, and to march on Antola on the 7th of March. We arrived at Antola on the 16th of March, and I reported the arrival of the brigade to Brigadier-General Collins. In the evening orders arrived from Sir Robert Napier to send on all the troops belonging to the 1st and 2nd Brigades, 1st Division, to the front immediately. The Royal Naval Brigade was at first attached to the 2nd Brigade, 1st Division, and marched from Antola on the 17th of March for Magdala, in company with B 21 Battery, Royal Artillery, 33rd Regiment Foot, 23rd Punjaub Pioneers, and a detachment of Scinde Horse.

After incessant and somewhat harassing marches we arrived at Lat on the 23rd of March, and joined the 1st Division under Sir Charles Stavely, marched on the 25th to join the Commander-in-Chief, who was reported to be at Dildee. On the 29th of March we marched on Takazze, and on arrival were enabled to telegraph to the Commander-in-Chief, who was encamped on the heights of Santara. We marched

on the 30th of March up the almost perpendicular ascent leading to Santara, and joined his Excellency the Commander-in-Chief. On my reporting the arrival of the brigade to his excellency he gave me a warm and hearty welcome, and expressed the gratification he felt at having a force representing the navy under his command. He also expressed his desire to see the rocket batteries drill and fire, in order that he might estimate their value. I accordingly turned out the Naval Brigade, and proceeded, under the immediate direction of the Commander-in-Chief, accompanied by his staff and a large number of the officers of the army, to the top of an adjoining hill and fired rockets at various elevations as directed by his excellency. On the conclusion of the practice, Sir Robert expressed his gratification at the appearance of the brigade, and at the efficiency, range, and power of the rockets, and immediately placed us in the 1st Brigade, under Brigadier-General Schneider.

On the 31st of March we marched with the Commander-in-Chief and the 1st Brigade, to which we were now attached, on Gahso, and thence on Abdikoom, Sindee, and across the Jisha, on to the Dalanta Plain, overlooking the Bashilo, and in view of King Theodore's camp, in the neighbourhood of Magdala. On the 10th of April we marched with the Commander-in-Chief and 1st Brigade, at 4.30 a.m., on Magdala by the King's road, down the steep and precipitous south bank of the Bashilo, and across the river. After crossing the Bashilo, a force consisting of a squadron of cavalry, the 4th Regiment, and Punjaub Pioneers, were sent under Sir Charles Stavely over the hills on the right of the King's road, but the path which they took was found impracticable for laden mules with the batteries, and the Naval Brigade and A 21 Battery Royal Artillery were therefore ordered to proceed by the King's road up the Arrogie Pass, the Naval Brigade leading. After ascending the pass, and on skirting Islamgie and Fahla Hills, within the range of the guns of the latter, King Theodore, who was on Fahla, opened fire on the Naval Brigade, and very shortly afterwards his troops, numbering about 10,000 men, descended with astonishing rapidity with the intention of attacking and cutting us off, having supposed that our battery mules were laden with baggage.

The Commander-in-Chief, who was on the spot, immediately directed me to form upon a commanding position, dismount the batteries, and open fire on the enemy, at the same time directing the infantry to advance. So easily are the rocket tubes handled, that they were brought into action in a very short time, and the Royal Naval Brigade were enabled to return the first shot; after this the fire was kept up with rapidity until the enemy were driven back, and I was ordered to take the batteries down on the plain to clear out the parties of King Theodore's troops who were firing from behind bushes. The action was concluded and the troops ordered off the field at dark, by which time 2,000 of the enemy were killed and wounded.

As much rain had fallen during the afternoon and evening, all were wet through; but as no tent could be pitched and a vigilant look-out had to be maintained, those not on guard slept in the battery. At

2.30 a.m. on the 11th April we shifted our ground, and encamped on the hill to the north-west of Magdala. At 8 a.m. Lieutenant Prideaux and Mr. Flad, two of the captives, accompanied by one of the chiefs of King Theodore, came into camp with a message from Theodore, stating that he felt unable to contend with the British force after the result of yesterday's engagement, and offering to give up the captives. Sir Robert wrote to say that King Theodore must come into camp himself, and that both he and his family should receive honourable treatment. The King returned the letter with indignation, but subsequently relented, and on Sunday, the 12th of April, sent in all the European captives. He did not come himself.

On Monday, the 13th of April, as the King had attempted to fly, but had found it impracticable to do so, and had not given himself up or surrendered Magdala, Sir Robert Napier resolved to proceed with the attack, and accordingly the force, consisting of the 1st Brigade and 2nd Brigade, which had by this time arrived, were moved on the plain between Islamgie and Fallah; the Native Infantry were sent to occupy Fahla, and the 33rd and 4th Regiments Islamgie. This was done without any resistance being offered, and the Naval Brigade and Artillery moved up under Magdala. King Theodore's army now laid down their arms by thousands, and only a small number remained with the King in Magdala. The Naval Brigade were placed on a ridge between Fahla and Islamgie, facing Magdala, whence we threw rockets into Magdala until ordered to advance.

On our arriving under the gate of the town the assault had commenced, and I therefore ordered the rocket tubes and some rockets to be carried up by hand after the infantry. The town was speedily taken, and King Theodore shot himself inside the gate. We bivouacked in Magdala that night, and returned to the camp on the morning of the 14th of April. The rockets, as reported by the captives and natives, had astonished King Theodore and his troops, and one had gone close to the King while he was on Fahla, which he afterwards picked up, and said to Mr. Flad it was impossible for him to fight against people who used such things. The Gallas tribes now began to come in and to rob and plunder the defenceless inhabitants who were leaving Magdala in great numbers for Debra Tebor and Tigré. I was, therefore, ordered to send out pickets with rockets to drive them off, and this duty was performed until we struck our camp.

On the 17th of April we re-crossed the Bashilo, ascending 3,500 feet by the King's road on to the Dalanta Plain, and encamped. On the following day Magdala was burnt, and the commander-in-chief came over with the remaining troops. A large quantity of hay and grain, crosses, jewels, and manuscript books were taken from Magdala, and all, excepting the books, were sold by auction, on the 20th. A trophy was selected and given to each battery and regiment. A valuable and handsome shield, with gold filigree and lion's skin, and a solid silver cross, fell to the lot of the Naval Brigade. The proceeds of the sale will be distributed among the troops, the manuscripts sent to the British Museum.

On the 20th of April the commander-in-chief held a grand review, on Dalanta Plain, of the troops, and made a speech,* in which he expressed his thanks to all for their zeal and devotion. The Naval Brigade was placed on the right of all troops, except the cavalry. On the 22nd of April we re-crossed the Jesha, and commenced the return march to Zoulla. The marching of the men of the Naval Brigade has been excellent throughout, no case having occurred of men falling out on the march, although their boots have frequently been conpletely worn through, and even men who were sick would endeavour to, and succeed in performing long marches. The most strict discipline has been maintained throughout, and in both these points especially the Naval Brigade can compare favourably with any troops.

I have now the very great pleasure of reporting that, although very few punishments have been requisite to maintain discipline, there are a large proportion of most deserving and praiseworthy officers, petty officers, and seamen, of whom I would wish to bring the names of the following more particularly to notice:—Lieutenant Charles Searle Cardale, who has always most zealously performed his duties, and assisted me most materially, and has always been ready to perform any duty. Mr. Henry Nanton Murray Sedgwick, assistant-surgeon, whose constant kindness and attention to the sick, often under trying circumstances, has met with my warmest approbation. Charles Henry Jones, chief gunner's mate, who has performed the duty of sergeant-major. Robert Smith, gunner's mate, who has done duty as quarter-master-sergeant, and has been most attentive and useful. Thomas Vaughan, boatswain's mate, and John Graham, boatswain's mate, who have throughout the march had the trying duty of bringing up the rear and superintending the reloading of mules that had cast their loads or broken down. Benjamin Starkes, coxswain of the barge, and Charles Austin, second captain of the foretop, who have done duty as sergeants of batteries.

I feel that I should fail in my duty were I to close this dispatch without recording the cordial and even warm feeling that has been shown by all ranks of our comrades in the army towards the Naval Brigade, from the commander-in-chief to the private soldier, and which feeling we most heartily reciprocate. I trust that the complete success in every particular of the Naval Brigade of the Abyssinian field force will give satisfaction.—I have the honour to be, etc.

T. H. Butter Fellowes, Commander, commanding.

The known intentions of the Fenians to make a new raid into Canada have led to the appointment of a squadron of British gunboats to patrol the St. Lawrence from Kingston to Prescott. There is nothing sudden or unforeseen in this measure, which, as published despatches show, has been in contemplation these three months.

* This will be found in our last number p. 340.

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 337.)

Name.	Place.	Position.	F. or Fl.	Ht. in Ft.	Dist seen Mls	Remarks, Bearings are by Compass.
48. Wreck on	Daunt's Rock	... ...	...	...	...	Lies N.W. ½ W. 105 fathoms from Black Buoy.
49. Bokel cay Light	Belize Ent.	17° 8'·8 N. 87° 56'·4 W.	F. F.	53 ...	6—8 ...	Est. 1st April, 1868, natural colour. Red.
50. Orfordness	England E. Coast	... ...	...	...	...	Established 15th May, 1868. The High light will be *Red*, between E ¼ N and E. by N. ¾ N. From former bearing the light to be marked towards the shore
Ditto	... ...	... ...	...	...	...	Ditto, Low light, *Red*, between S.W. ½ S. and S.W. ½ W. to cover the Sizewell Bank. Also marked from former bearing towards the shore.
51. Paternoster Rocks	Kattegat Entrance	57° 53'·5 N. 11° 35' E.	R.	...	...	Est. (?) A white flash every 90 secs. On which Karlsteen light will be discontinued.
Hallo Is.	... ...	58° 20'·2 N. 11° 13'·4 E.	Fl.	...	...	Flash every 40 seconds.
Svenskar	Stockholm Skaren	59° 35' N. 19° 45' E.	F. F.	... ...	... ...	Established (?) Light vessel showing two lights.
Holman Is.	Aland Is.	60° 12' N. 19° 17' E.	F.	23	...	Established 1st May, 1868.
52. Cape Canaveral	... ...	28° 27' N. 80° 33' W.	R.	139	18	Established 10th May, 1868. Revolves once a minute.
East Pascagoula	Mississipi	... ...	F.	35	10	Est. 20th April, 1868. Lights the horizon over an arc of 270°.
53. Medas Isle.	Spain S. Co.	42° 2'·9 N. 3° 13'·6 E.	F.	283	15	Established 1st June, 1868. See Notice No. 53.
54. Point Haut Bane	France N. Coast	... ...	F.fl.	...	...	Preparing to suspend present light.
55. Bristol Channel	Buoys	Changes in	...	...	...	For which see chart, being general.
56. Point Delamara	Malta S.E. Coast	35° 49'·7 N. 14° 34' E.	R.	151	15	Established 1st July, 1868. Shewing a red and a white light alternately every half-minute, visible from the northwards between the bearings of S.W. by S. and S.E. by E.
57. Bristol Channel	Buoys	Changes in	...	...	...	For which see chart.
58. Ostende	Tide Signals	... ...	...	...	...	See Notice No. 58.
59. Vada Rocks	Italy W. Co.	43° 19'·2 N. 10° 21'·9 E.	F.	55	10	Est. 1st July, 1868. On screw piles.

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

No. 53.—This light, situated at the south extreme of the Gulf of Rosas, is a guide for the channel between Isles Medas and Estardis; this channel is from 4 to 5 cables wide, with a depth of from 9 to 14 fathoms in the middle.

Bearings are Magnetic. Variation 27½° *Westerly in* 1868.

No. 58. OSTENDE.—*Tide Signal Lights.*—The Belgian Government has given notice, that from the 1st day of April, 1868, the following modifications of the signals, indicating the depth of water in the port of Ostende, would be established.

With Rising Tide.—When there is a depth of 11 feet water on the bar a *red* light will be placed at the jetty angle, in addition to the fixed *red* light at the extremity of the East pier-head. This light will be extinguished when the established light, indicating a depth of 16 feet and over, is seen.

With Falling Tide.—Immediately the light indicating a depth of 16 feet and above is extinguished, the *red* light on the jetty angle will again appear, with the fixed *red* light at the extremity of the East pier-head, until the moment the depth is less than 11 feet on the bar.

HYDROGRAPHY.

WE reserve this for comment in our next, as it appears to be going the round of the papers, notwithstanding the looseness of some of the assertions which it contains.

Charts of the Coast from Cape Finisterre to Cape St. Vincent.

The following despatch has been received at the Foreign-office in reference to imperfect Charts:—

"Cadiz, May 25, 1868.

"My Lord,—I have the honour to enclose herewith a 'Wreck Return' (of British ship Science) for the Board of Trade, in which I have remarked on the Lighthouse at the entrance of Cadiz Bay. In offering these observations I would venture most respectfully to solicit the attention of the Board of Trade to the imperfect surveys (as given in our most recent Charts) of portions of the Coast from Cape Finisterre to Cape St. Vincent. The soundings laid down in these Charts are, in some instances, very incorrect, and the surveys north of Vigo imperfect, many known rocks and reefs not being reported in the Charts, or any notice given of them. In foggy weather this defect is peculiarly dangerous. The soundings near 'the Burlings' (Islands) are often given incorrectly, and little confidence is to be placed in them. The currents between Cape St. Vincent and Trafalgar are very unaccountable and peculiar, nor does it appear to me that, up to this time, any careful system of observation respecting them has been accomplished. They are, of course, affected by the Mediterranean current through the Straits of Gibraltar, and also by the winds and by the tides, since the flood tide sets out of the Mediterranean against the regular current, and *vice versa*. Off Trafalgar the regular Gibraltar Straits' current begins to be felt, and it is between Trafalgar and Cape St. Vincent

that the strange irregularities and unexplained peculiarities of currents —to which I beg leave to call attention—are most prevalent.

A. G. DUNLOP.

"The Lord Stanley, Foreign-office."

REMARKS BY CONSUL AT CADIZ.

"The two Lighthouses at Cadiz and Chipiona are about five miles separated; the entrance from sea to Cadiz Harbour between them. Cadiz Light is not revolving, but flashes a red light every minute, during which time the white light is obscured. Chipiona Light is a revolving light, but the Cadiz Light often appears revolving at eight or ten miles from shore, because the red flash is almost invisible at that distance, unless in clear, fine weather.

"I think it injudicious to have two lights so near, so easily mistaken the one for the other.

"A. GRAHAM DUNLOP, Consul.

"Cadiz, May 25, 1868."

THE PORT OF LONDON: LIMITS.

AN interesting case on the subject of employing pilots has just been decided in the Court of Exchequer, from which we learn what are the limits of the Port of London.

COURT OF EXCHEQUER.—JUNE 12th.

Sittings in Banco.—(Before the Lord Chief Baron and Barons Martin, Bramwell, and Channell.)

The General Steam Navigation Company v. The British Colonial Steamship Company (Limited).—Judgment.

This case raised a question of great importance with regard to pilotage in the river Thames. The action was brought to recover damages for injury sustained by the ship *Stork* by a collision with a vessel belonging to the defendants called the *Thames*, a little to the west of Yantlet Creek, which is several miles east of Gravesend. The vessel Thames belonged to the port of London, and at the time of the occurrence was coming up river on a voyage from Quebec, and in charge of a licensed pilot, who had been taken on board at Dungeness for the purpose of navigating the vessel as far as Gravesend. The trial took place at Guildhall before the late Lord Chief Baron, and resulted in a verdict for the plaintiffs, but the case involved several points of law, which were referred to this court and argued at considerable length a few days ago. The Merchant Shipping Act of 1854 made it compulsory on the owner or master to take a pilot at Dungeness, and provided that in cases where a pilot was so compulsorily employed, the owner or master should not be liable for any damage or loss caused by the pilot's negligence. There was, however, a proviso

in the same act exempting from compulsory pilotage vessels of the port of London not carrying passengers, while they were being navigated in that port. The defendants said they were not liable, inasmuch as at the time of the accident their vessel was in the charge of a pilot, in accordance with the provisions of the act; while, on the other hand, the plantiffs contended that when the vessel reached Yantlet Creek, which they said was the boundary of the port of London, the limit for compulsory pilotage ceased, and that therefore when the collision happened the relation between the plantiffs and the pilot was that of master and servant, and that consequently they were liable for the consequences of his negligence.

Baron Martin, in reading his judgment, said it was concurred in generally by Baron Channell, and Baron Bramwell, although he had not heard enough of the case to pronounce formally his opinion, had read his judgment and approved of it. His lordship then entered at length into the circumstances of the case, and the authorities quoted, and said he was clearly of opinion that the pilot taken compulsorily on board, under the provisions of the Act of Parliament, was not the servant of the shipowner, and that, both by common law and the statute, the shipowner was not liable for the negligence of the former. He thought that the pilot was in charge of the ship from Dungeness to Gravesend; that he alone was responsible for what occurred; and that no responsibility was cast on the defendants by the mere circumstance that the ship had arrived west of Yantlet Creek. With regard to the limit of the port of London eastward, he had great difficulty in arriving at a conclusion; but the learned arbitrator in this case had found that the port extended from London on the west to Yantlet Creek on the east, and he was inclined to agree with him.

Baron Channell said he also thought that the defendants were entitled to succeed, and he would have written his judgment if he had known judgment was to be given to-day.

The Lord Chief Baron, differing from his learned brethren, was of opinion that according to the whole current of the legal and historical authorities, from the earliest times, the port of London was co-extensive with the jurisdiction of the city of London, and extended from Staines bridge to Yantlet Creek. He therefore thought that at the place in question the defendants were not compelled to employ a pilot, and acting upon the decision of the Privy Council in a similar case, the highest court of appeal in the matter, he thought that the defendants were liable for the acts of the pilot.

The majority being for the defendants judgment was entered for them.

NOTES ON NOVELTIES.

THE CREW OF THE TORNADO.—The following opinion has been given by Sir Robert P. Collier and Mr. C. J. Cottingham upon a case laid before them on behalf of the crew of the *Tornado*. The points submitted to counsel were: —

1. Have the crew a well-founded claim to compensation from the Spanish government?

1. We are of opinion that, assuming the statements of the crew to be substantially correct, they have a well-founded claim to compensation. The Spanish government having justified their detention on the ground of their being required as witnesses, we think the length of time they were detained so unreasonable, and their treatment so severe and cruel, that their claim will not necessarily fail even if the vessel should ultimately be condemned.

2. Is it the duty of the British government, under the circumstances set forth, to press and enforce the claim already formally made?

3. Can a second trial cure the illegalities and incompetency of the first trial, or affect the crew's right to compensation?

2. and 3. The fresh proceedings instituted after the failure of the first appear to us of a very strange, not to say oppressive character, but we have not the materials before us on which to form a decided opinion whether or not they are contrary to Spanish law. It is the duty of the government to inform themselves upon this subject, and if they should be satisfied that these proceedings are authorised by Spanish law, to lose no time in protesting against them and demanding compensation. If they should not be so satisfied, a reasonable time must be allowed for the termination of the proceedings. But inasmuch as the amount of the claim (at all events) will a good deal depend upon the ultimate decision as to the character of the vessel, we do not see how the government can be required immediately to insist upon the payment of any definite sum by the Spanish government.

4. What steps do counsel advise the crew now to adopt? Joint opinion.

4. The only course open to the crews is to make representations to the Foreign-office, and we think they are entitled to urge that no further unnecessary delay should be permitted.

(Signed) R. P. Collier, C. J. Cottingham.

Temple, May 27th, 1868.

The Island of Guam.—We learn from the Sandwich Islands that the brig *Ana*, which sailed in December last from thence for Guam, took away ten fine horses, to improve the breed of that island. She also carried two oil presses, one rice mill, one cotton gin, and other agricultural machinery. We are glad to see a trade springing up with that port, which has many years been a resort of whalemen. The Ladrone Islands are twenty in number, of which Guam is the principal one. They belong to Spain, which has a Governor residing at Guam: and a full account of it from a Spanish officer we have given in our recent volumes. Five of the islands are inhabited, and are said to be very fertile and well adapted to rice, sugar, coffee, and cotton.

Japanese Navy.—We see by the same paper that the Japanese are gradually strengthening their navy. At the Sandwich Islands they say:—The *Stonewall*, which dropped in on us yesterday, is a curiosity

—outside or inside—a naval oddity. Those who have longed to see a "Rebel craft," have now a chance to examine one of the sauciest, ugliest war weapons of her size ever seen afloat. The natives, especially, can now see what terrible engines of war the rebels brought against their Government, and even with their aid had to give up the contest. Her mission now is a peaceful one, and she will not have an opportunity to try her strength with our crack Hawaiian navy. Her history is thus given:—She is an iron plated vessel, built originally in France for the rebels. On her arrival at Havana about the time the confederacy caved in, she was surrendered to the Captain General of Cuba, who delivered her up to the United States Government. About a year ago she was sold to the Japanese government, and is now on her way out to Yokohama.

THE LATE JAMAICA TRAGEDIES.

A PAPER has been sent to us on late proceedings concerning the ex-governor of Jamaica. Our limits, as well as the main object of this journal, exclude such proceedings from it unless they directly affect the Navy. And as the Navy was induced by the above ex-governor to partake in his illegal proceedings of hanging, shooting, and flogging unhappy negroes in that island, the *Nautical Magazine* was not slow in expressing its opinion on the subject, and the course which, according to that opinion, a naval officer in command should take when applied to for power by a governor. All this our May number of last year will show, besides those of January and February of the previous year. That we were right in our opinion appears from the charge of Lord Chief Justice Cockburn, and we expressed our satisfaction that it was shewn by his lordship that the new duty of executioners of the above acts could not be legally required of naval officers by any governor. As far as this journal was concerned that was sufficient. We were confirmed in our view, and by that we should continue to act notwithstanding a junior judge on the bench has, in a later case, expressed dissent from the doctrine of his chief. We have nothing to do with the unsatisfactory condition in which the subject has been left by the recent charge of Mr. Justice Blackburn, but are content with that of the Chief Justice, and all the authorities cited by that able lawyer, Mr. F. Harrison. No doubt it is difficult to find a Grand Jury free from taint, as the first of these trials would show, and it is curious that a similar body of gentlemen were supplied with doctrine denied in its truth by the Lord Chief Justice! Hence the ex-governor and his victims have been unable to obtain justice even in England! Whether from design or accident, the aggrievor and the aggrieved have lost the benefit of the law of their land. Every one must regret this, and as, has been well observed, we can only hope that a salutary lesson will have been gathered by excitable governors of colonies from the convincing and luminous arguments relating to

martial law which the Lord Chief Justice of England has set forth, and to which the majority of the judges in the Court of Queen's Bench have now given their approval.

The whole subject is of so important a nature, in a nautical point of view, that we preserve here the following digest of these two cases from the *Daily News*:—

When are we to hear the last of Ex-governor Eyre and his doings at Jamaica? On the opening of the court, the usually solemn precincts of Westminster Hall were thrown into a state of excitement, as the "liners" would say, by a singular scene which took place between the Lord Chief Justice and Mr. Justice Blackburn on the subject of certain statements in the charge which the latter recently addressed to the Grand Jury on the indictment preferred against Mr. Eyre by the Jamaica Committee. When Mr. Justice Blackburn had finished his exposition of the law in the case, he informed the Grand Jury that he had taken every opportunity of consulting his brother judges, and he believed himself authorized to declare that they all agreed in the principles he had laid down. The judges of his own court were specially referred to as having been in consultation with him upon the points involved in the charge, and as having authorized him to express their agreement with him.

Some surprise, we learn, was felt at these statements at the time, not so much at their unusual character, because it was felt that the case was of the highest importance, and it was fitting that the statement of the legal principles upon which it depended should rest on the highest authority, but because it was impossible not to see that many expressions of the learned Judge were irreconcilable with the previous charge of the Lord Chief Justice. This difficulty was removed on Monday, by the statement of the Lord Chief Justice, in which he maintained that many of the rulings of his colleague were not concurred in by a "majority" of the judges. After stating the "basis" of the charge to which the members of the court had agreed, and adding, "not only was the legal doctrine to which I have referred all that the rest of the court in fact assented to, but I feel justified in saying that it was all they expected would be embraced in the charge as necessary for the guidance of the jury." The Lord Chief Justice proceeded to notice the points in which Mr. Justice Blackburn's direction was at variance with the opinion of the court. "I differ from the learned judge, in the first place, in the conclusion at which he seems to have arrived, that martial law, in the modern acceptation of the term, was ever exercised legally in this country against civilians not taken in arms."

In the second place, the Chief Justice dissented from the opinion expressed by the senior puisne judge that the Jamaica statutes authorised martial law in any other sense than that of compelling the inhabitants of the island to undertake military duties, and then subjecting them to military discipline. "But, above all," continued the Lord Chief Justice, "I dissent from the direction of Mr. Justice Blackburn in telling the Grand Jury that the removal of Mr. Gordon

from Kingston into the proclaimed district for the purpose of subjecting him to martial law was legally justifiable. I emphatically repudiate the notion of sharing that opinion." When the Lord Chief Justice had finished his communication to the Bar, Mr. Justice Blackburn followed with his statement, describing the conference between himself and the other members of the Court before he delivered his charge, and the way in which the misunderstanding seems to have arisen. It is painful to add that a comparison of the two statements compels the conclusion that the misapprehension was due to some negligence on both sides, while justice itself is discredited by the fact that the Grand Jury threw out the Bill against Mr. Eyre under the influence of a charge some of the leading doctrines of which are now emphatically repudiated by the Lord Chief Justice.—The *Times* remarks that the result is painful and creditable to neither party involved in it. If Mr. Justice Blackburn unduly amplified the assent of his colleagues, his colleagues ought to have seen that the narrow principle he stated to them was insufficient to justify that expression of their approval they did authorize him to use.

There was great imprudence on all sides, the chief and first being that Sir Colin Blackburn did not commit the whole of his Charge to writing before consulting his colleagues, while the end has been a scandal in the administration of our law for a parallel to which we must vainly seek in recent years, perhaps not in recent generations.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, *in June*, 1868.—*Sold by J. D. Potter*, 31, *Poultry, and* 11, *King Street, Tower Hill, London.*

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AUSTRALIAN DIRECTORY, Vol. I. South and East Coasts, Bass Strait, and Tasmania. Sixth Edition. Capt. Yule, R.N. 1868. 9s.

EDWARD DUNSTERVILLE, *Commander, R.N.*

Hydrographic Office, Admiralty, 20th June, 1868.

TO FRIENDS AND CORRESPONDENTS.

BERMUDA reserved. Will appear in course of Journal.

SYDNEY. We trust the Supplement will be approved, as being well placed.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

AUGUST, 1868.

Leaves from a Journal.

It is somewhat venturesome to speak about places that have been visited by a crowd of voyagers. The least remark has been anticipated in print. It will be better, therefore, to lay aside all attempts at description of scenery, and plunge headlong into the vortex of staple commodities as they turn up. As the ship lay at anchor off Barbados, casting my eyes over the small area of the island, my first surprise was the marvellous wealth which is every year drawn from its soil. My surprise was by no means lessened by the consideration that it all arises from its single product of sugar! One million hogsheads of this article, besides molasses, is annually exported from Barbados.

In other parts of the world riches crop up for a season, and the golden harvest passes by. Such are the Pennsylvanian oil wells, the gold diggings of California. But here, in this little island, for generation after generation the earth has yielded its increase, without shewing signs of diminution, although the soil is one of the poorest in the West Indies!

The surface of this island of Barbados is generally very level, rising gradually from Bridgetown, in the south, to a range of low hills moderately high in the north. As the fresh water supply is good at all times, although the rainy season is short and far from plentiful, it is supposed by many that the springs of the island owe their origin to a communication with the continent of America. A rather curious speculation which may be left for the geologist or philosopher. The main pipe which supplies Bridgetown, the capital, is fifteen inches in diameter, and its head is three hundred feet above the level of the sea. As there are not many elevations above this, it is hard to believe that

such a small watershed catches sufficient rain to keep up such a bountiful supply throughout the year. The great elevation of the reservoir has been taken advantage of to fit up the streets with an admirable system of hydrants, which are placed at every seventy-five feet. The water issues from the branch pipe with a force sufficient to drive in an ordinary door or window. There are three stations where the hose reels are fitted on light carts, or trucks, ready for immediate use. Four men and a sergeant keep watch there day and night, and, in the event of a fire, the first party that turns on a hose receives a gratuity of one pound sterling. This system has only been in force since the calamitous fire some few years ago.

The whole of the island is one vast mass of coral, and recent examinations with the microscope prove that the soil is composed of infusion which could only have been formed at a vast depth in the sea.

The roads are cut through the solid rock and the white dust which blinds one during a strong sea breeze, once formed the substance of living animals. A walk through the dusty streets in summer is something to be remembered should it happen that the sea breeze is blowing home.

The physical effect of the liberation of the slaves is becoming more apparent every year, the race is deteriorating, both black and mulatto. The magnificent Hebes, who in my younger days used to sail along rather than walk the Bay Road, with well balanced pitchers on their heads resting on the gay bandana handkerchief which, simple as it was, became their superb figures and glossy black hair, far more than all the bijouterie of Paris. The stalwart negro is fast degenerating, from three causes,—disease, hard work in early youth, and living in wretched over-crowded dwellings. It is not uncommon to find several families residing in one small crazy tenement by the road side, without a separate apartment for the children to sleep in. If ever Barbados is visited by a hurricane, to a moral certainty we shall hear of their houses flying through the air like kites.

In those days of slavery the slaves on every estate were allotted work according to their age and strength; the sick were nursed like valuable animals, as they were, and the supply of food was abundant. Now, so crowded is the population (thicker than in China), that scarcity or want among the poor is by no means uncommon. In the crop season hundreds visit Demerara and other colonies *in quest of labour*, which then is there in demand. But nothing can induce them to remain long from their favourite island. Want at home, with them, is preferable to abundance elsewhere. Not long ago five hundred emigrated to Liberia. The result was a sad tale of neglect, disease, and death. All have returned who could raise the means, but many yet remain in that land of fever and imposition who will probably never live to return.

Negroes take more delight in boating, or working on board ship, than in field labour. They always appear to retain a vivid recollection of their former condition. In some places they will not carry the smallest article on their backs; I have seen a whole gang strike work

with one consent, when such kind of labour has been assigned to them. In Barbados there are many who gain their livelihood by catching the flying fish. Many people, as well as myself, have been under the delusion that the flying fish was caught at night, by placing lanterns in boats, the light being supposed to attract the fish. It might have been a matter of surprise with me that more were not caught on board ships through the main deck ports, but I never thought of questioning the long received theory of the fish rushing to the light. Great was my astonishment, therefore, to find a large fleet of small sailing boats dancing over the crisp, blue waves under the lee of the island; each provided with the circular nets shaped like an English shrimping net, and adopting the following process. These nets are towed from the boat's stern and quarters. The larger net is six feet in diameter and the smaller four. Under a very heavy press of sail the boat rushes through the water at the rate of four or five knots an hour, when at certain intervals, or when a large quantity of fish is supposed to be entrapped, the nets are hauled into the boat and emptied. A good daily catch is reckoned at six hundred fish, which are sold in the market at the rate of ten for sixpence. Fishermen here do not differ from their brethren in other parts of the world, especially in respect of affluence. The hire of the boat cuts off a considerable item from their profits, and should they, unfortunately, not get the fish to market in time they must be thrown away, as no such food can be kept fresh more than a few hours.

Although hurricanes of late years have not been so extensive or severe (with one exception), as they used to be, it is evident that the islands of the West Indies are not safe from the possibility of occasional visits from such unwelcome scourges. I have always connected the falling off of the north-east trade wind with their scarceness of late years; and it will be curious to note if their revival (which I hear is becoming established), will in any way tend to restore the trade wind.*

Running before the delicious light trade wind, we arrived off the picturesque island of Grenada. How well named is this jewel of the Caribbean Sea with its lofty hills covered with plantations of cocoa, and its valleys with sugar cane. The former produce is now largely grown by small negro proprietors, as the labour required to mature it is much less than that of sugar. A great quantity of fruit is also grown, which is justly esteemed the best flavoured in the West Indies, and is largely exported to Barbados.

The pretty little harbour of St. George's is on the south-west side of Grenada, and, by a somewhat tortuous entrance, is accessible to the largest man-of-war on the station. It is evidently the remnant of a crater, as the whole island is volcanic. In November, 1867, this little port was the scene of a singular flux and reflux of the sea, occasioned by an earthquake, and yet, strange to say, when contemplating its quiet beauty, no traces of violence appear to be left. A monster wave

* See Volume of this work, for 1848, for an historical account of West India hurricanes page 397, etc., besides others since, in subsequent volumes.

rushed into the harbour at four o'clock in the afternoon without a symptom of warning from sea or sky. The sun was overhead with his wonted brilliance; the sea-breeze had died away, and not a ripple was to be seen on the surface of the harbour, when on a sudden the water in the harbour rose seven feet, flowed over the piers, filled the lower stories of the warehouses and dwelling houses in the lower part of the town. In a few minutes afterwards the water subsided as silently as it had risen, and left places bare where only just before ten feet had been the average height.

For more than an hour this huge pulsation of the sea kept at work rising and falling alternately, to the great terror of the inhabitants, who were momentarily expecting to be overwhelmed, as Tortola was supposed to have been. The motion of translation must have been very gentle, or the rickety wooden wharves of St. George's harbour would soon have been broken up. The stone watering pier near the town was destroyed. People who have been exposed to some sudden or great danger are always so prone to magnify the evil, that it is difficult to arrive at a satisfactory conclusion as to the real result of any great disaster. A person of some station in life states seriously that the heavy stones at the basement of the pier were thrown several feet high in the air, while others affirm that it was broken by the first inrush of the wave, as it lay directly opposite the harbour's mouth, and opposed to its course; at all events, under the circumstances it has totally disappeared, and now its absence is the only visible proof of the power of the wave.*

The forts in Grenada are still in excellent condition; neither neglect, nor earthquakes, nor lapse of time, appear to have the slightest effect on their massive masonry. The searching vegetation of the tropics attempts in vain to find a crevice in the well indurated mortar to invade it with roots; the sides are stained only by time. Would not the secret of so much solidity in this mortar be worth knowing? As one looks on all these remnants of old times and sees them standing deserted and desolate, it is natural to ask the question,—To whom will these lovely islands ultimately belong? Are they to be gradually given up to the negro race, or are they to fall into the hands of the citizens of the Great Republic? One event is certain, that the race is not yet in existence which shall bring back to them their former prosperity. The negro will not do it, for he lacks industry, and that spirit of combination and enterprise from which springs the prosperity of a people. He is fond of the luxuries of a civilized life, but he wants the energy to procure them. Possessing, as these islands do, so fine a soil, no limit could be placed to their productiveness, and they have the further advantage of being within easy reach of the markets of the old and new worlds. Yet they appear to be doomed; day after day

* On this subject we have recorded instances of the power of the sea in tearing huge boulders of rock from the fore-shore of the breakwater of Plymouth Sound, and hurling them over the whole body of the work into various parts of the anchorage of the Sound, and these boulders were some tons in weight.

they appear to relapse into their primeval state, and under existing circumstances will continue to do so.

The run from Grenada to Port Royal, Jamaica, has nothing to interest anyone. The sea is a mere desert with scarcely a sign of life, and the air equally so. Scarcely is a vessel to be met with. There are occasions when the first view of Jamaica repays one for the numerous discomforts of a sea voyage, and yet once Jamaica made an impression on my mind never to be forgotten. The night had been squally; thunder and lightning with heavy rain had made it long and tedious. Towards morning the wind had entirely died away and the sky clearing the high land was seen looming almost over our heads. As daylight advanced the blue mountains appeared shaded with a dark indigo colour blending towards the horizon into pink and pale green. The valleys were full of vapour, in some places of a light gauzy texture, and in others of an opal colour. Through the latter were great rents giving glimpses of the scenery beyond as may be seen the blue sky between masses of the cumulus cloud. The long reef which fringes the shore to the westward of Morant Point was breaking in never ceasing lines of foam on the yellow beach, and hiding the trees and bushes near the shore in clouds of mist. The white lighthouse and many other buildings stood out clearly from their dark background of evergreen foliage, and helped to complete a picture which required little from man to make it perfect. But nothing is further from my intention than writing a book, being only desirous of dotting down what may not have been mentioned by every day voyagers.

We are now at anchor in Port Royal Harbour, the scene of so many of those jolly carousals of the old buccaneers.* The old town has long disappeared beneath the waves in an earthquake; yes, somewhere about two hundred years ago, men say on account of its sins, and the only wonder is that its successor has not long since gone after it, as it has long been considered by naval officers (who ought to be good judges) to be the greatest sink of iniquity in the colonies. On very

* Freebooters as they were then called. The occurrence of this term "Freebooter" for that of "Buccaneer," affords us an opportunity of alluding to the adopted English word Filibustier which is not only used as a noun and applied also in the plural number as "Filibustiers," but also an adjective. Thus we read of "filibustiering" expeditions. Now this word "Filibustier" is the Spanish expression of our term "Freebooter," and will be met with repeatedly in the work of Senor Narvarrete in four large volumes containing the journals of the voyages of the old Spanish navigators. Narvarrete used our term "Freebooter," but spelt it as the Spaniards would pronounce it. It is well known that those "freebooters" were English privateers, who were let loose from this country, and carried on their plundering expeditions against Spanish property of all kinds in the West Indies. Thus Watling Island (the Landfall of Columbus, his Guanahani) was named after Captain Watling, a celebrated freebooter. The term "filibustering," frequently employed by American writers, is a Spanish pronunciation of our term "freebooting," re-adopted with its Spanish dress; and will no doubt take its place in an English dictionary, as derived from the Spanish word "filibustering," while this in its mongrel foreign dress, deserves to be expelled, as a misplaced term, for our word "freebooting:" affording a good instance of the queer derivation of some of our every day words.—ED.

clear calm days the remains of the old town are supposed to be visible, to which the eye may be guided by a buoy which lies over the church steeple.

The entrance to the harbour is so remarkable that it is deserving of some notice. On the right hand side (entering) is a low sandy spit nearly level with the water, called the Pallisades, which is so steep that a man might drop on it from the yard arm of a line of battle ship as she sails in. Here the sand is so loose that one sinks ankle deep into it at every step, and this same spit of sand descends into the sea like a wall for more than thirty feet, and a few feet farther on there are fifty. It is just possible that this part may have been formed from the ruins of the town at the great earthquake, by the remains of forts and houses, as brick is seen everywhere, the material used. Such a conjecture may not be impossible. There are numerous traditions of the great sharks which once kept guard around ships of war to prevent the seamen from deserting, and which were regularly fed by their patrons. The Point is supposed to have been the rendezvous when off duty, and only one man is named who was sufficiently cunning to catch them. He was a captain in the artillery, and waged unremitting warfare against the whole race of sharks. The following anecdote is said to have been commonly related by him at a banquet given by the Commodore. His story runs thus:—"It is now many years since I was fishing for my old enemies on this Point, when in throwing out the bait the bight of the line caught my seals, jerked the watch from my pocket, and swung it into the sea. Of course I set it down as a lost watch and thought no more of it. Well, gentlemen, I left the station for some years, as you know, and on returning I resumed my old occupation, when one day I hooked a gigantic ground shark, and after great difficulty succeeded in landing him. My servant immediately cut open his stomach, and pray, gentlemen, What do you think I found therein? The identical watch was the unanimous answer. No, gentlemen, upon my word, I found nothing but g . . s." Certainly there was no reason for doubting the truth of this assertion.

The chief exhibition of Port Royal is the burial ground on the Pallisades. Curiosity takes the visitor there once but never twice. Hamlet himself would not be induced to soliloquize there a second time! This modern Golgotha is situated dead to windward of the town of Port Royal, about half a mile distant, and every day the Trade wind wafts its miasma odours to the inhabitants; this is a fact that may account for an occasional case of fever, as the dead bodies that lie there interred are frequently level with the surface of the ground, and then the coffin rests on water which percolates through the shingle from the sea. In former times the inhabitants of Port Royal of some standing in society were buried, or rather cased over in this ground in circular brick vaults. The sandy foundation gives way, and the ends of these vaults become broken. But so true is the principle of the arch that but few of them are fallen in. Yet the coffins become rotten shreds or dust, but the mortal remains of man or woman are still the tenant of each. A visitor on looking in

on these remnants of mortality is suddenly startled by a concealed intruder. The land-crab rattles his shell against the bones over which he is thus disturbed and retreats, or loth to leave his prey he pauses, raises his claws looking defiance on one who so unceremoniously invaded his domain. He is bold from the loneliness in which he is allowed to remain, but may perhaps retire to the shore through the rows of yellow fever cases which are interred amidst the huge cactus, which is growing luxuriantly, and which as well as himself is well nourished by the decaying bodies of England's seamen.

In some parts of these pallisades where the surface dips a little, a sickening odour is sent forth especially if the air be still, which if the land-crab fails drives the visitor to the healthier air off the sea-beach. There, a walk on the edge of the surf distracts his attention from the sad picture he has just witnessed. Recently the ground has been marked out, and the sites of future graves numbered, but there can be no doubt that for sanitary reasons alone, if not out of respect for the dead, no more bodies should be interred there!

(To be continued.)

The Luminous Sea.

Curiosity has not been oftener excited with the phenomena of nature, nor with more pleasing sensations to those who have witnessed its full effects, than by the luminous appearance of the sea. In the tropical regions where nature spreads her richest treasures, this phenomenon is seen in its greatest splendour, and the mariner, with no great stretch of the imagination has often fancied himself in a sea of liquid fire.

On the coast of Mexico in the Pacific Ocean, during the calm of night, when stars are only visible above, the sea has assumed this appearance to such a degree that a ship actually seems to be floating in a bed of sparks of active fire, and as she rises with the surface swell, or dashes it from her by any sudden effect of a wave, it curls from off her sides as a sheet of fire throwing a broad glare of light. This appearance so gratifying to the eye is sufficient to fill the mind of the person who may be contemplating it with wonder and astonishment, and the cause of it is naturally his first question. That it proceeds from animalculæ is generally known; but their nature and the circumstances under which the light is emitted is with many persons still a matter of speculation. We have therefore considered it a subject worthy of attention, and shall lay before our readers in the present and another number or two some account of this curious phenomenon.

The first we take from the philosophical transactions of the Royal Society, entitled "Mr. Macartney's observations on Luminous Animals," and although his paper was read long ago it has all the interest of yesterday, and is as follows:—

The property which certain animals have of emitting light is so curious that it has attracted the attention of naturalists in all ages. It was particularly noticed by Aristotle and Pliny among the ancients, and the publications of the different learned societies of Europe contain numerous memoirs on the subject. Notwithstanding the degree of regard bestowed on the history of luminous animals, it is still very imperfect.

The power of producing light appears to have been attributed to several creatures which do not possess it. Some species which enjoy it in an eminent degree, have been imperfectly described or entirely unobserved. The organs which afford the light in certain animals have not been examined by dissection; and lastly, the explanations which have been given of the phenomena of this light are unsatisfactory, and in some instances palpably erroneous.

As this subject forms an interesting part of the history of organized beings, I have for some years availed myself of such opportunities as have occurred for its investigation. Having communicated the result of some of my researches to the Right Honourable Sir Joseph Banks, he immediately offered me his assistance with that liberality which so eminently distinguishes him as a lover of science. I am indebted to him for an inspection of the valuable journal he kept during his voyage with Captain Cook; for permission to copy the original drawings in his possession of those luminous animals discovered in both the voyages of Cook; and for some notes on the luminous appearance of the sea that were presented to him by Captain Horsburgh, whose accuracy of observation is already known to this learned society.

In the following paper I shall first examine the grounds on which the property of showing lights has been ascribed to certain animals, which either do not possess it or in which its existence is questionable. I shall next give an account of some luminous species of which some have been inaccurately described, and others quite unknown. I shall endeavour to explain from my own observations, and the information communicated to me by others, many of the circumstances attending the luminous appearance of the sea. I shall then describe the organs employed for the production of light in certain species; and lastly, I shall review the opinions which have been entertained respecting the nature and origin of animal light, and relate the experiments I have made for elucidating this part of the subject.

The property of emitting light has been reported to belong to several fishes, more particularly the mackerel, the moon fish (*Tetradon ircola*), the dorado, mullet, sprat, etc.

M. Bajon observed during the migration of the dorados, that their bodies were covered with luminous points. These points, however, proved on examination to be minute spherical particles, that adhered to the surface of these fishes; and he adds, appeared to be precisely the same sort of points that illuminated the whole of the sea at the time. They were therefore in all probability the minute kind of medusæ which I shall have occasion to describe hereafter.

Godehan de Rivilla states in a paper sent to the Academy of

Sciences at Paris, that on opening the *Scomber polamus* he found in different parts of its body an oil which gave out much light. But it should be observed that Rivilla had a particular theory to support for which this fact was very convenient, and that other parts of his memoir bear marks of inaccuracy. It may be added that if the oil of fishes were usually luminous, which Rivilla supposed, it would be almost universally known, instead of resting on a solitary observation.

As far as I am able to determine from what I have seen, the faculty of exhibiting light during life does not belong to the class of fishes. It appears probable that some fishes may have acquired the character of being luminous, from evolving light soon after death.

Some species of *lepas*, *murex*, and *chama*, and some star-fish have been known to possess the power of shining; and the assertion has been repeated by one writer after another; but without quoting any authority.

Brugueire saw on one occasion, as he supposed common earthworms in a luminous state: all the hedges were filled with them; he remarked that the light resided in the posterior part of the body.

Hanguerges pretended to have seen earthworms luminous in three instances, it was each time in October: the body shone at every part, but most brilliantly at the genital organs.

Notwithstanding this concurrence of testimony, it is next to impossible that animals so frequently before our eyes as the common earthworm, should be endowed with so remarkable a property without every person having observed it.

In different systems of natural history the property of shining is attributed to the *cancer pulex*. The authorities for this opinion are Hablitzl, Thules, and Bernard. The former observed on one occasion a cable, that was drawn up from the sea, exhibit light, which on closer inspection was proved to be covered with these insects. Thules and Bernard reported that they met with a number of this species of *cancer* on the borders of a river, entirely luminous. I am nevertheless disposed to question the luminous property of the *cancer pulex*, as I have often had the animal in my possession, and never perceived it emit any light.

The account given by Linneus of the *Scolopendra phosphorea* is so improbable and inconsistent, that one might be led to doubt the existence of this insect; particularly as it does not appear to have been ever seen except by Ekaberg, the captain of an East Indiaman, from whom Linneus learned its history.

I now proceed to the description of those luminous animals that have been discovered by Sir Joseph Banks, Captain Horsburg, and myself. On the passage from Madeira to Rio Janeiro the sea was observed by Sir Joseph Banks to be unusually luminous, flashing in many parts like lightning. He directed some of the water to be hauled up, in which he discovered two kinds of animals that occasioned the phenomenon: the one a crustaceous insect which he called the *cancer fulgens*, the other a large species of *medusa* to which he gave the name of *pellucens*.

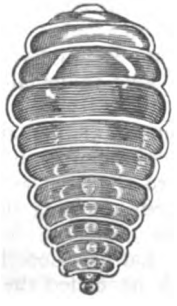
The *cancer fulgens* bears some resemblance to the common shrimp. It is however considerably less: the legs are furnished with numerous *seta* (hair or bristles). The light of this animal which is very brilliant appears to issue from every part of its body.

The *medusa pellucens* measures about six inches across the crown or *umbella* (round head containing the seed). This part is marked by a number of opaque lines that pass off from the centre to the circumference. The edge of the *umbella* is divided into lobulas which succeed each other; one large and two small ones alternately. From within the margin of the umbella, there are suspended a number of long cord-shaped *tentacula*. The central part of the animal is opaque and furnished with four thick irregularly shaped processes, which hang down in the midst of the tentacula.

This zoophyte is the most splendid of the luminous inhabitants of the ocean. The flashes of light emitted during its contractions are so vivid as to affect the sight of the spectator.

In the notes communicated to Sir Joseph Banks by Captain Horsburg, he remarks that the luminous state of the sea between the tropics is generally accompanied with the appearance of a great number of marine animals of various kinds on the surface of the water, to many of which, however, he does not attribute the property of shining. At other times when the water which gave out light was examined it appeared to contain only small particles of a dusky straw colour, which dissolved with the slightest touch of the finger. He likewise observes that in Bombay during the hot weather of May and June he has frequently seen the edges of the sea illuminated by minute sparkling points.

At sunrise on the 12th of April, 1798, he perceived several luminous spots in the water, of which spots, conceiving them to be animals, he went in a boat and caught one. It proved to be an insect somewhat resembling in appearance the wood-louse, and was about one-third of an inch in length. When viewed with a microscope it seemed to be formed by sections, of a thin crustaceous substance. During the time that any fluid remained in the animal, it shone brilliantly like the firefly.



In the month of June of the same year, he picked up another luminous insect on a sandy beach that was also covered with a thin shell, but it was of a different shape, and of a larger size than the animal taken in the Arabian Sea.

Comparing the above description with a neat pen and ink sketch, made by Captain Horsburg, and which accompanied his paper, I have no doubt that both these insects were *monoculi*. The first evidently belongs to the genus *Limulus* of Muller. I shall therefore beg leave to distinguish it by the name of *Limulus Nocticulus*.

My pursuits and the state of my health having frequently led me to the coast, I have had many opportunities of making observations on the animals which illuminate our own seas. Of these I have discovered three species, one of which is a *verue*, not hitherto described by authors: another agrees so nearly with the *Medusa hemispherica*, that I conceive it to be the same, or at least a variety of that species. The third is a minute species of *Medusa*, which I believe to be the luminous animal so frequently seen by navigators; although it has never been distinctly examined or described. It is drawn here magnified to about twelve times its natural size.

I first met with these animals in the month of October, 1804, at Herne Bay, a small watering place on the North coast of Kent. Having observed the sea to be extremely luminous for several nights, I had a considerable quantity of the water taken up. When perfectly at rest no light was emitted, but on the slightest agitation of the vessel in which the water was contained, a brilliant scintillation was perceived, particularly towards the surface. When the vessel was suddenly struck, a flash of light issued from the top of the water, in consequence of so many points shining at the same moment. And when any of these sparkling points were removed from the water, they no longer yielded any light. They were so transparent that in the air they appeared like globules of water. They were so minute as to be even less than the head of the smallest pin. On the slightest touch they broke and vanished from the sight.

Having strained a quantity of the luminous water, a great number of these transparent corpuscules were obtained upon cloth, and the water which had been strained did not afterwards exhibit the least light.

I then put some sea-water that had been rendered particularly clear by repeated filtration, into a large glass vessel, and having floated in it a fine cloth on which I had previously collected a number of luminous points, several of them were liberated, and became distinctly visible in their natural element, by placing the glass before a piece of dark coloured paper. They were observed to have a tendency to come to the surface of the water, and after the glass had been set aside for some time, they were found congregated together, and when thus collected in a body they had a dusky straw colour; although individually they were so transparent, as to be perfectly invisible, except under particular circumstances. Their substance indeed was so extremely tender and delicate, that they did not become opaque in distilled vinegar or alcohol until immersed in these liquors for a considerable time.

On examining these minute globules with the microscope, they proved

to be not quite perfect spheres. They had an irregular depression on one side that was formed of an opaque substance that receded rather inwards, producing such an appearance as would arise from tying the neck of a round bag, and turning it into the body.

The motions of these creatures in the water were slow and graceful, and not accompanied by any visible contractions of their bodies. After death they always subsided to the bottom of the vessel.

From the sparkling light afforded by this species, I shall distinguish it by the name of *Medusa Scintillans*.

On the night after that in which I discovered the preceding animal, I caught two others of the luminous species. One of these I call the *Beroe fulgens*. This most elegant creature is of a colour changing between purple, violet, and pale blue. The form of it is difficult to assign as it is varied by partial contractions at the animal's pleasure.

I have represented here the two extremes of form which I have seen this creature assume. The first is somewhat that of a cucumber, which being that which it takes when at rest should perhaps be considered as its proper shape. The other is that of a pear. The body is hollow, or forms internally an infundibealar cavity, having a wide opening before, and it appears also to have a small aperture posteriorly. The posterior part, and indeed two thirds of the body, are ornamented with eight longitudinal ciliated ribs, the process of which are kept in such rapid rotatory motion while the animal is swimming, that they appear like the continual passing of a fluid along the ribs. The ciliated ribs have been described by Professor Mitchell as arteries in a luminous *Beroe*, which I suspect is no other than the species of which I am giving this account.

When the *Beroe fulgens* swarm gently near the surface of the water, its whole body became occasionally illuminated in a slight degree. During its contractions a stronger light issued from the ribs, and when a sudden shock was communicated to the water which contained several of these animals, a vivid flash was thrown out. If the body were broken, the fragments continued luminous for some seconds, and being rubbed on the hand left a light like that of phosphorus. This, however, as well as every other mode of emitting light, ceased after the death of the animal.

The hemispherical species that I discovered had a very faint purple colour. The largest that I found measured about three quarters of an inch in diameter. The margin of the *umbella* was undivided and surrounded internally by a row of pale brown spots, and numerous small twisted *tentacula*. Four opaque lines crossed in an arched manner from the circumference towards the centre of the animal. An opaque irregularly shaped process hung down from the middle of the *umbella*. When this part was examined with a lens of high power, I discovered that it was enclosed in a sheath in which it moved. The extremity of the process was found to be divided into four *tentaculas*, covered with little cusps or suckers, like those on the tentacula of the cuttle fish.

This species of *Medusa* bears a striking resemblance to the figures *Medusa hemispherica*, published by Grouoviers and Müller. Indeed it differs as little from these figures as they do from each other. Its luminous property, however, was not observed by these naturalists, and this is the more extraordinary as Müller examined it at night, and says that it is so transparent it can only be seen by the light of a lamp. If it should still be considered as a distinct species, or as a variety of the *hemispherica*, I would propose to call it the *Medusa lucida*.

In this species the central spot and the part round the margin are commonly seen to shine on lifting the animal out of the water into the air, when it presents the appearance of an illuminated wheel. And when it is exposed to the usual percussion of the water, the transparent parts are alone luminous.

In the month of September, 1865, I again visited Herne Bay, and frequently had opportunities of witnessing the luminous appearance of the sea. I caught many of the hemispherical and minute species of *Medusa*, but not one of the *Beroe fulgens*. I observed that these luminous animals always retreated from the surface of the water as soon as the moon rose. I found also that exposure to the daylight took away their property of shining, which was viewed by placing them for some time in a dark situation.

In that season I had two opportunities of seeing an extended illumination of the sea, produced by the above animal. The first night in which I saw this singular phenomenon was extremely dark. Many of the *Medusa hemispherica* and the *Medusa scintillaus* had been observed at low water, but on the return of the tide they had suddenly disappeared. On looking towards the sea, I was astonished to perceive a flash of light about six yards broad, extend from the shore for about the distance of a mile and a half along the surface of the water. The second time when I saw this kind of light proceed from the sea, it did not take the same form, but was diffused over the surface of the waves next to the shore, and was so strong that for a moment I could see my servant standing a short distance from me. He also perceived it, and called out to me at the same instant. On both these occasions the flash was visible for four or five seconds; and although I remained watching for a considerable time, I did not see it repeated.

(To be continued.)

The tablet to the memory of Sir Joseph Banks, which Dr. J. E. Gray has erected in the church at Heston, near Hounslow, bears the following inscription:—"In this church is buried the Right Hon. Sir Joseph Banks, Bart., C.B., President of the Royal Society from 1778 to 1820. He died at Spring-grove on the 19th of June, 1820, aged seventy-seven years."

A Hurricane of the China Sea late in the Season.*

To the Editor of the Nautical Magazine.

Singapore, February 6th, 1868.

Sir,—I wish to call attention to the fact that typhoons sometimes happen in the Palawan passage in December.

The barque *Labuan* left Cape St. James (Cochin China) for Hong Kong, on November 27th, 1867, experienced strong N.E. winds and heavy sea until December 6th, when at 5 p m. sighted the London South breakers, moderate easterly winds and variable weather until December 21st. Barometer steady until December 20th, 29·78. December 21st at noon, barometer 29·57. Fresh E. by N. wind, and overcast, but the Palawan land very clearly defined. Pagoda Cliffs (so well described in China Pilot Appendix No. 2), S.E. ½ E. easterly dist. 40°, 0.45 p.m. Saw Bombay Shoal right ahead N. by E. wind, increasing fast, in top-gallant-sails and one reef (after staying the vessel). Two p m. very heavy squalls and heavy rain, sea rising all at once. Three p.m. sudden shifts to S E., hard squalls and rain. Wore ship to N.E., the glass rising, and the centre bearing S.W., congratulated myself on having got nicely clear. Made all the sail the ship would bear (close reefed top-sails, fore-sail, reefed main-sail, mainstay-sail, and foretop-mast stay-sail). Blowing a whole gale at S.E., and the seas apparently fighting each other, particularly the N.E. and S.E. runs. Six p.m. a dense wall to S.E. Bar. rising did not take in sail, having a fair wind, and thinking that the storm would be travelling westward till midnight. Hard gale S.E., and very heavy squalls with rain. Bar. suddenly fell to 29·50 from 29 60 at 10 p.m.

1.0 p.m.	... Barometer	...	29·50
2.0 p.m.	... „	...	29 60
3.45 p.m.	... „	...	29·47
4 35 p.m.	... „	...	29·50
5.0 p.m.	... „	...	29·52
5.30 p.m.	... „	...	29 51
6.0 p.m.	... „	...	29·55
8 0 p.m.	... „	...	29·56
10.0 p.m.	... „	...	29·60
Midnight	... „	...	29·50

December 22nd a.m., barometer oscillating, but concave, until—

Noon	... Barometer	...	29·48
2.0 p.m.	... „	...	29·44
Then gradually rising until 6 p.m.		...	29 55

December 22nd, a.m. Blowing very hard and hauling to the E.S.E. Bar. oscillating very much. 2.0, In reefed main-sail. 4.0. Blowing harder and hauling to east, in fore-sail. 7.0, Hard gale at east, sea heaped up and in a most irregular jumble, in foretop-sail. 10.0, In

* In our last number appeared a condensed account of this hurricane encountered by the *Labuan*: more particulars of which are here related by her captain.

maintop-sail, and hove to under storm-mizen stay-sail, and a gig's awning in the mizen-rigging. Noon, furious wind E. by N. with tremendous squalls. Two p.m. blowing a hurricane E. by N., sea completely white, and ship unmanageable, taking great quantities of water over both top-gallant-rails; nobody able to stand at the pumps, the poop-doors and windows all battened to, skylights secured, etc. Barometer 29·44 the lowest reading. Barometer rising, wind moderating until 6 p m., when enabled to set foretop-mast stay-sail, and wear round on the port tack. Afterwards, 7 p m., set fore-sail, wind N.E., hard gale and turbulent sea. Midnight, wind N.N.E. land gale.

December 23rd, a.m, hard gale N.N.E., and nasty sea, 2.0. Barometer 29·60, thermometer 81°, set reefed main-sail and close reefed top-sails, wind gradually decreasing, and sea getting more regular. At noon, barometer 29·67, thermometer 81°, strong N.N.E. wind and cloudy. Latter part strong N.N.E. wind and fine weather.

Was this a double cyclone or a stationary one? Our lat. by D.K. at noon of the 22nd was 10° 10′ N. long. account, 117° 24′ E. not far out, as I had had bearings of the Palawan land at 6 p.m. of the 21st. I send you the *Anne's* report of the same cyclone on the same day, his D. K. gives lat. 10° 10′ N., long. 117° 51′ E. Our wind gives the centre S. by E. from us when we had the worst of it at 2 p.m. 22nd, He was in the centre at 2 p.m same day, shift from S.S.W. to N.N.E. his D.K. gives him due east of me 27′, our position is the most likely to be correct, as I had seen the Bombay Shoal, and also the land. He had had no observations for six days, and then worked his reckoning back. The storm was evidently travelling to the eastward, I make it travelling nearly E.N.E., parallel with the coast of Palawan. The *Anne* would make it about S.S.E. (from the shift from S.S.W. to N.N.E.) Perhaps it had only just formed, it evidently was not of large diameter then.

The cyclone of December 21st, I am inclined to believe was travelling to the north and west, as the *Monette*, French 3-masted schooner, put back to Saigon on December 26th, *totally dismasted.* She is a clipper schooner and would, I think, try the middle of the China Sea. The bank to S.E. seen by us, may have been another storm following the coast line. What more likely than for a cyclone to separate like currents of water? Coming through Balabec strait, one is very likely to get cut, as it were, into two diverging streams, one to N.W., the other along the land.

One more remark, Sir, concerning the Typhoon reported by the *Northfleet* in your number for August, 1866. I was in Sual (Gulf of Lingayen, Luzen) on May 1st, 1866. We had had very fine weather for some time. Our log-book says, "May 1st, one p.m., heavy gusts of wind from the eastward, let go starboard anchor; two, wind veered to S.E. by E. with heavy rain." I was at Lingayen so did not note the Bar. but the French barque, *Admiral de Mackau*, arrived at Sual May 7th, and begged me to report his having experienced a typhoon, which report is in the Hong-Kong *Daily Press* of May 18th, 1866.

Trusting that you may find this of use, in helping to determine the tracks and seasons of cyclones in the China Sea, and apologizing for the length of the paper,

I remain, etc.,
CHARLES J. GREEN,
Master Barque *Labuan*.

The London South breakers appear to be laid down correctly. We passed about half a mile from them. They appeared like two reefs a cable apart, not connected; the water being smooth the breakers did not show white, but more like a tide ripple than anything else. Evening coming on I did not lower, as I otherwise should have done, to examine.

I remain, Sir,
CHARLES J. GREEN.

COLLISIONS BY STEAM VESSELS.

SIR,—I have lately perused much of what has been written on the subject of Collisions, brought about by attempting to follow the existing Rule of the Road, and do not hesitate to state, that nearly all the writers on this subject, either avoid the point at issue, or only tell us what is already known; and as the basis of their argument is perfectly untenable, and founded on supposition only (simply because the present system of side signal lights is so undeniably at fault), that no amount of theoretical illustration, or versification, can make seamen practically conversant with it.

What is required to prevent (or lessen the risk of) Collisions, is the *Rule of the Road made pure and simple*, and that is what my plan, of placing danger signals, will completely, and unerringly accomplish.

It was lately remarked by a very able writer, in a letter which appeared in the *Shipping and Mercantile Gazette*, on the subject of the present Rule of the Road, that perhaps it would be advisable for me to practically illustrate my plan, by the employment of steam vessels, etc., for that purpose. The best answer I can give to such a proposition is, that I have lived long enough to know, that others, who have gone before me, have found to their cost, that such a course of procedure has not only materially impoverished their exchequer, but they have had to abandon their project, and ultimately have been left to drink the dregs of bitter disappointment!

Knowing this, I beg to state that I have not the most remote idea of illustrating my plan as proposed by the said writer, who (I would here observe) could not have sufficiently looked at the subject, when he penned his remarks, as its simplicity requires little or no illustration, to make it completely understood by all.

In support of which remark, it may not perhaps be out of place here

to quote the following, which appeared in the *Nautical and Commercial Monthly* of April, 1868, and written by the late Captain J. H. Bell, its editor, who, when reviewing one of my letters on the subject of collisions by steam vessels, says, "We have hitherto purposely refrained from comment, on our correspondent's proposed improvement, in the Signal Light system, in hopes that some one interested in the present very defective, and highly dangerous, and improper plan of placing signals would come forward in its defence. We fully endorse Captain Heckford's views in every particular," etc., and to it may I add the belief, that this must be the opinion of every man, who can look at the subject practically and disinterestedly.

If the facts connected with my proposed improvement, in the Signal Light system, such as I have for all practical purposes publicly demonstrated, seem to be passed unnoticed by those who should at least not forget the duty they owe the public, especially when thousands of lives, and millions of property, are staked on the issue of their opinions, to where, may I ask are we to look for a solution of this important question, viz., that of simplifying the Rule of the Road at sea. If it is only to be found (eventually) in a revision of those rules now in force, accompanied by diagrams as regards the present side lights, I submit it will make confusion worse confounded. For until the exact and relative positions of two or more steam vessels meeting on a dark night, from various points of the compass, can be instantaneously ascertained, diagrams as a reference will be found useless, and judgment as a consequence must take precedence of the rule.

With all that has been said and written on the subject of the present system of side light signals, let us take a retrospective view of the past twelve months, as compared with the year ending 1866, in which year the number of collisions to ships and steam vessels was 1958, and for the year ending 1867, 2062. Thus showing an excess of 104 cases of collision for the past year, and which must bear a very large proportion to the increase of new vessels, during the same period.

Are such facts, and figures as these, not enough to demonstrate the absolute necessity for the rectification of a system, that yearly destroys untold wealth, with its hecatombs of innocent human beings, that tends to lower the prestige of our Merchant Navy, that pauperises our seaport cities and towns, and places a blot on the escutcheon of the Maritime interests of this great country.

For all this, I maintain there is a specific remedy, in the plan submitted by me, in my former letters; by which the Rule of the Road could be made clear and simple, and a collision at night (with ordinary care) next to an impossibility.

Yours faithfully,
N. HECKFORD,
Late Surveyor of Shipping, Port of Calcutta.

Forest Gate, Essex,
July 9th, 1868.

To the Editor of the Nautical Magazine.

Vide, April of the present year, p. 208; also Vol. 1867, pp. 180, 214, 675.

The International Maritime Exhibition of Havre.

Our neighbours at Havre on the opposite side of the channel are doing a service to Nautical men that they should not be slow to appreciate. Nothing less than providing them with an exhibition of all kinds of articles employed by them afloat, not only from an anchor-stock to a fish-hook, but even from a capstan-bar to a boat-hook, verily they are ahead of John Bull in getting up a useful display although Johnny may be ahead of them in the long run. But for making the most of everything and doing such things as exhibitions commend us to our lively neighbours. A maritime exhibition is a novelty in this age of novelties. Shall we ever follow suit? Most likely not, for John Bull is an old fashioned apathetic old gentleman not given to too much encouragement. However of all places on the coast, Havre is one of the best for a maritime fair. It is "just in the way," like a rock in one of the Channels of the Chusan islands, and is just such a place of call that an exhibition of this kind requires—exactly on the road-side; that is of that high road which leads round the world.

But how is it to be described? for that, Mr. Editor, is the object before me, and where and how to begin requires consideration. So let us begin with the site of the exhibition. Aye, there are the quiet basins which form the harbour along with their jetties, etc., and what better could there be for the materials of old Neptune, scientific or rude, trading matters, and all belonging; and above all, fishery articles and its nursery! This last in itself is enough to make an exhibition, when it includes the culture, the breeding, and rearing of the most valuable of the finny tribe that are employed by the lords of creation, sea lords and all, as one of the essentials belonging to the staff of life. And then again the oyster beds. The French have long ago set us an example, in the construction of oyster beds, in the culture of which they excel. We have been endeavouring to copy them in the Exe and Medway (but of this last I do not speak with certainty), however, as yet with but little success; for like many other of the arts and sciences the element is essential to its development. Still tolerably extensive as the ground may be the produce of this latter department would be seen to far more advantage in the neighbourhood of Basque Roads than at Havre. And yet the aquarium as it is called provided for these delicacies and their companions the Fins is a very respectable space, surrounded with those temporary edifices which one sees at all improvised exhibitions. Still there seems to be a general feeling that several of the subjects at the present exhibition are quite capable and of sufficient importance each to form exhibitions of their own.

There can be no doubt that favourable as the Emperor Napoleon is said to be to see these results of the national enterprise, that our French neighbours have abundance of inducement to get them up; while John Bull sadly wants such a leader to overcome his apathy to shew what he could do. The people also are different, besides knowing how to go to work. But should that ever be overcome and some enter-

prising Englishman attempt such a show as this it is to be hoped that he will exclude from it many things that we see here in the way of harness for horses, and farming matters, including shore-going rather than maritime materials.

One of the principal objects also besides the rigging matters of ships in general, is that of a fair comparison in reference to the intention of the employment that the different vessels will afford which frequent the port of Havre. What a range will this afford, including as it will the steamers of the different companies that frequent this port besides the numerous vessels of innumerable forms and sizes that frequent Havre. Imagine this subject dealt with as it should be in all its particulars—the branch of trade in which each is employed, the best qualities of equipment, form, rig, etc., and build. Why this alone, with an account of the fishing craft and the well-known chasse marees would of themselves fill another volume of description. Then the passenger ships, their accommodation of passengers and their treatment, the length of their passages, their table provision, etc. All this would form another very interesting kind of information that would be very valuable, setting many points in their true light, and most acceptable to persons who are meditating sea voyages, especially where emigrants are concerned. All these things and many more which such an exhibition as this must suggest would form the substance of most valuable information if it could only be honestly thrown together.

Another of the legitimate objects of the exhibition is that invaluable article the ship's anchor, which holds a conspicuous position at the show, amidst coils of rope, patent steering wheels and screw propellers, and models of different vessels of ample variety.

All this is just what it should be. Let everything have fair play. There can be no doubt that although every one of them will have their day, the best, that is those which are best adapted for their purpose will have the longest day. It is the way of the world, and more especially where economy is secured, which is one of the qualifications that go far in constituting the "best." It is said that the articles exhibited from this country by no means abound at this maritime show. How is that? Surely we should have known of it in time for our people to have contributed their proper quota. But verily there seems some reason for concluding that it was a late idea,—one not so generally diffused as it should have been. Whatever may have been the cause maritime Britain has been left in the lurch at Havre.

Among the strange collection of objects displayed is one of a kind certainly applicable enough at sea but no less so on shore, and to say the truth there are really too many of these shore going articles. But, the French are a curious race, they don't do things by halves. What do you think of veritable false teeth being displayed as a maritime article essential for use on board ship. But they have no peculiar recommendation for use on salt water, such as being antidotes to sea-sickness, no recommendation of strength as being well adapted for hard sea biscuit or tough salt junk. There they are for what they are worth for use on shore or afloat, an advantage perhaps as being fit for

any kind of hard work. Nothing however appears about that tooth-brush which was proposed once for the mouth of the Thames. That indeed must have been a veritable maritime brush. It would be worth while to know whether such articles are to be included among those which are to be rewarded with prizes, for it is said that at the conclusion of the show in October next, the Emperor and Empress are to distribute these incitements to competition.

But after all it seems that fish, fish-culture, and fish-training, and fishing, that is killing them after rearing them by "hook or crook," form after all the principal objects of the exhibition. The aquarium shewing the nursery is without doubt superb, happy they must be to have such a home. This is no less a place than one designed of basaltic columns such as are seen to perfection at Fingall's cave somewhere in the north of Ireland, and which is certainly a magnificent affair. And here in true character are seals enjoying themselves after their own fashion in this hot weather, while seabirds which seem to have come here on purpose are to be seen looking on enjoying themselves quite as much on the rocky cliffs of this aquarium as the seals in the water. The crustaceous species, zoophytes, polypes. molluscs, radiates *et hæc genus omne* and all other genuses besides are here enjoying the space assigned to them with as much *gusto* as if (as they really are) they were in their own element: nor are the gulls at a loss for entertaining their feathered friends being as much at home here as if it were an old established affair.

Of course in an exhibition of this nature our old friends Messrs. Peacock and Buchan whose fame is well-known to our pages; of course we say, the highly preservative nature of the anti-corrosive metallic composition of these gentlemen has been looked for. How could such an exhibition be complete without their invaluable paint, that matchless composition which has been so frequently alluded to in these pages, be absent from Havre Exhibition. But Mr. Peacock is not only for looking after the perfectly clean state of ships exposed to the ever-encroaching weed on their bottom, but he also figures in a life preserving mattress of cork shavings, and what other article so well entitled to its place here. This is not the first time that we have met with this invention, and we are not surprised at finding it appreciated as it should be. But if this has done much in saving life the composition paints have even been more successful in saving the pockets of ship owners. There is no doubt from the result of experience that an unctuous slimy surface is produced on the metal by the composition of the paint while it lasts, which is well compared to the coating secreted by fishes, for it is well known, that, when from age old fish unable to supply this slimy material become covered with barnacles they die. But iron ships being recoated renew their safety covering, and thus defy the barnacle. Now this is an easy process, and as it can be renewed above the water line during a voyage where hard rubs are likely to displace it, we are not surprised at the high favour in which it stands wherever ships are to withstand the deleterious effects of the barnacle.

One of the most complete instances we have recorded of the effects of the barnacle was that of the *Pioneer*, related in our volume for 1866, which vessel, her commander says, "would *neither sail nor steer* long before she reached the Equator from Scilly." However, these matters are well known to the readers of the *Nautical*, and so is Peacock's paint, as the best antidote against barnacles. We shall, however, conclude our observations for the present on the Havre Maritime Exhibition, with the following extract from the correspondent of the *Daily News*, giving a comparative view of the fish farming of our neighbours, but more especially in reference to the oyster.

Oyster farming is a special industry of the French coast-folk. Oyster beds, parcs, and claires are everywhere laid down when the ground is anything like suitable, and the most unsuitable ground has in many places been converted into very good breeding and fattening soil for oysters by the industry and determination of those interested. A few samples of artificial bred oysters, both from the imperial oyster nurseries, and from the nurseries of private growers as well, have been shown at all the recent fishery expositions. But what must be very disappointing to all who feel an interest in the culture is, that there is not here, nor has there been at any of the other fishery shows, either in this country or in Holland, a display of these molluscs, showing their ratio of growth.

What is chiefly wanted as regards all sea animals which are good for food is a knowledge of their rate of growth and the age at which they become reproductive, a point of fish life about which our information is very deficient, but which both the French and Dutch governments are taking steps to remedy. The story of the origin of oyster culture in France is now a thrice-told tale, and indeed, with the exception that the French oyster-farmers begin their labours by gathering the seed, their system of working the beds is pretty much the same as that of the men of Whitstable or the Colne. If our English dredgers on the great beds of Kent and Essex were to take measures to secure the spat just as it exudes from the mother oysters, they would then be on a par with the oyster-farmers of Arcachon and the Ile de Ré, which latter place is now a famous oyster island. Both in England and France the beds are systematically worked in order that the numerous enemies of the oyster may be captured and killed, and that the molluscs may be classified according to size. The advantage of this labour is evinced in the prosperous condition of the Whitstable layings, and of the artificial beds in the basin of Arcachon, whilst the disadvantages of non-culture may be witnessed at Newhaven, near Edinburgh, where the finest natural scalps in the world are suffering from not being thoroughly worked. The Firth of Forth oyster beds are natural scalps of the most productive order on which the spat falls with almost undeviating regularity, but they have suffered during late years from over dredging; the men, who have hitherto held the scalps from the corporation of Edinburgh at a merely nominal rent, were tempted to dispose of several shiploads of their natives before they had arrived at a mature age, an injury to the beds which it will take several years to repair.

The spat mystery obtains no illustration at this exhibition, which is much to be regretted. Our "layings" in England are suffering sadly from want of a great accession of spat. There has been no fall of any consequence on many of the usual grounds for some years, and if the mother oysters have emitted a brewing of spat it has been lost through some unfortunate tidal influence. On the new artificial beds at Hayling Island a copious fall of spat has taken place during the last two seasons, and the natural oyster-beds of the Firth of Forth have also given forth a copious supply. I am of opinion that there is a spat of greater or lesser magnitude every year, only we do not always obtain it, because we have not hit on any plan of ensuring its fall upon the bed from which it is emitted. There are various exhibits here in the nature of contrivances to catch the spat, which is the chief point in oyster farming, because if the young oysters do not obtain a holding-on place, "a coign of vantage," to which, "shut up in measureless content in their pearly prison," they can cling till they are wanted for market, they are lost for ever. If the spat should fall on muddy ground, no oysters will result from it, as the young mollusc requires a stony or shelly bottom for its proper growth. Faggots have, however, been successfully tried at various places, in order to intercept the spat, and a tile coated with cement has been invented by Dr. Kemmever, of St. Martin's (Ile de Ré), for the same purpose. As soon as the little animal has had time to fasten itself properly to the tile, or rather to the coating of cement with which it is covered, the stuff is torn off and laid down among the stones, so that the tile can be recoated for future use.

The most suitable of all bottoms, however, for the growth of the oyster is the natural bottom, or "culch," as it is called. It is usually composed of old oyster shells, stones of various sizes, and such other matters as are usually found at the bottom of the sea. On the Ile de Ré, the beds on the foreshore—and they are found to answer most admirably—are constructed in a very homely way of such stones and débris as can be found on the island, and can be most easily used. At Arcachon, in the Imperial nurseries, many different spat collectors have been tried; among others, one that is known as "the hive:" it is a wooden cabinet, with various boxes and drawers, and these being filled with gravel and small stones, are well adapted to the collection of spat. As the tide leaves some of the Arcachon oyster-beds dry at low water, they can be worked with great effect.

An important question in connection with the economy of our fisheries, and that might be advantageously illustrated at a fishery exposition, but is not so illustrated, is that relating to bait, which is every year becoming of greater importance. How are we to catch our cod and haddocks if we cannot obtain bait? In some parts of Holland, where there are no mussels, the fishermen intend, so soon as they go into line fishing (at present they do little else but trawl) to cut up their lampreys to make bait for the alluring of other fishes. Here we shall soon require to adopt a similar expensive expedient, as our mussel scalps are rapidly being exhausted. So many hooks are now required

for the capture of a certain per centage of cod or haddock, that the demand for bait is becoming excessive—so excessive, that if more mussels cannot be obtained a substitute of some kind must be found. In this country they grow their mussels the same as they do their oysters. I have just seen a sample of the mussels of Esnandes (near la Rochelle), which are regularly cultivated, and yield an excellent return for the labour of those employed. The seed is obtained gratis, being washed inshore from some natural beds. It is received (the mussel spat) on gigantic wooden posts, where it is allowed to remain till it becomes the size of a bean, after which it is transplanted to the bouchots further inshore. The bouchots are composed of the slender branches of trees interlaced on strong wooden posts, and the young mussels are fixed upon these in pockets of old nets, and they remain on the outer series of bouchots for a season or two, when they are again transplanted still further inland, and kept there till they are ready to be gathered for market. A large number of persons are employed in the cultivation of this mussel farm, and the product is of excellent quality and of great value. Now what the French do we might do, and, although we do not, like them, use the mussels for food, we do require countless quantities of them as bait for our line fisheries. But enough of fish.

The fine arts department of this international maritime exhibition is very good in its way, but what it has to do with naval or maritime interests of any kind would puzzle a conjuror to determine? It is, in fact, a pictorial and antiquarian museum, and with the exception of a stand of Blots, well-modelled fisher folk, and a few old war galleys, has nothing of *la mer* about it. The department is not, however, without interest; the pictures are well worth looking at, and the porcelain, if I may be allowed to quote the opinion of an old lady, "the porcelain is divine." The fine arts gallery will be, to many at least, a welcome relief from the contemplation of the numerous articles of utility which crowd the exposition.

The opening ceremonial was a great success. The speeches were read, and a poem written for the occasion was recited in a large dock warehouse before a very numerous audience. After a cantata had been played, a procession was formed to the exhibition, which was then formally declared open. A banquet in the evening brought the proceedings to a close.

Owhyhee, the Port of Hilo or Waiakean Bay.

We have had occasion, in some of our late numbers, to allude to that group of islands which were made known to Englishmen by our great circumnavigator Captain James Cook, and which were named by him after the First Lord of the Admiralty the Sandwich Islands. They have a tractable, although not a very numerous population, and have

been governed by a race of kings descended from their ancient warriors. But they are looked on with jealousy, and a desire of possession, as we have shewn in a recent number, and we have added still later the opinion of the native government on the figure they would make under the care of annexation. This opinion, to our mind, is a proof of their good sense, and one which we have no doubt will entitle them to respect. The principal paper of the islands published at Honolulu gives occasionally some interesting sketches of island scenery, to which print we are indebted for the account of its great volcano of Mauna Loa, the largest of the world. The annexed sketch of Hilo derives an interest from the importance of its seaport, the position of which will be seen in the chart of Owhyhee, published in our number for August last, where they will find it on the eastern side of the island, with Mauna Kuah or Keah towering above it; but a larger plan of the place will be found in the Admiralty Chart of the Sandwich Islands (No. 1510 Cat.), published by Potter, of the Poultry.

The approach to Hilo, over the elevated table-land that extends from Mauna Kea to the ocean, is through luxuriant cane-fields, by green lawns, taro patches, groves of plantains and bananas, while here and there are scattered clumps of mangoes and pride of China, waving over neat *halepilis*, or more substantial and comfortable farm houses. It is a scene of rural beauty, with tintings of the grand and picturesque. The sea surging in a thunder-voice against the lofty and precipitous cliffs, or murmuring among the rocky coves and inlets; the deep and narrow gorges where silvery streams murmur in waterfalls, or leap in cascades; the lofty domes of the grand mountains bounding the vision on the right, down from which sweeps the vast, variegated and verdure-covered plain to the sea, all combine to render it a landscape that will fix itself upon the memory like a picture of beauty, with ever fresh and glowing colours. In front is a deep indentation in the land, which extends and terminates in a beautiful bay, on whose crescent shores wave the cocoa palm and the tall banana, with an air of tropical loveliness and luxuriance; among the deep green groves, the white houses glitter in the declining sun, and the churches lift their spires to heaven. Reflecting the crimson clouds over the gate of the sun's farewell, the quiet bay sleeps like a giant rose-leaf on an emerald plain. Two vessels with furled sails are lying quietly at anchor, and a peace and tranquil beauty rests upon the scene, as the shadows of twilight fall over it like a veil. But the moon comes out under a white cloud, like that of the stubborn Alp gazed upon at the siege at Corinth, but large enough for him to lose love and hope for ever, as it passed. Her soft, silvery light gave new tints to the scene and new outlines of loveliness. It lit with glory the lovely bay, and our eyes traced the long column of light on the rippling waters, far out until its base was lost in the deep blue sea. How beautiful is our mother earth! Ever smiling, glad and joyous, ever decked in robes of beauty, grand in her simplicity, majestic in her great zone of ocean, her crown of snow-clad mountains, and stern and mild in her deserts, rocks, and glens! Prolific in reproduction, she makes life spring beneath the tread of

time, and renews and decks herself with flowers, faster than his scythe can mow them! We derive our existence and draw our sustenance from her, sleep upon her bosom, and after our final repose return our dust to her. In loving earth and all that is beautiful and pure in nature, we worship God!

We threaded the streets of Hilo by moonlight, and enjoyed the majesty of repose that seemed to rest upon everything, except the murmuring waves, which died in music along the shore. Greeted with generous hospitality, we were welcomed and made "at home." Exhilarated and refreshed in a manner most appreciable by wayfarers, we arose next morning, and examined the port of Hilo and environs.

Hilo, the second town in population and commercial importance in the Hawaiian Islands, is situated on a beautiful bay of the same name, on the windward side of Hawaii. The bay of Hilo was formerly called Waiakea, and frequently Byron's bay, but the present native name, being to the "manor born," and more appropriate, has by general consent superseded the others. It is in North latitude 19° 45′ and 155° 06′ West longitude from Greenwich. The anchorage is good and the harbour capacious. The crescent shore slopes to the water's edge, where it terminates in a regular sandy beach. The boat landing is excellent.

The approach to Hilo from the sea affords a beautiful view of the most tropical and verdant spot in the islands. The vegetation and trees are greener and more luxuriant in foliage, owing to frequent showers, than in any other locality. The gardens are luxuriant, the flowers in eternal bloom, and the plantains and bananas grow taller than anywhere else it has been our lot to see them, and many groves of them look like tall and tangled forests. They are loaded with fruit. We noticed the mango, the orange, the tamarind and other fruit trees, but from some cause they did not seem so productive as those of Lahaina or Honolulu. The cabbage would wake dreams of sour krout in "der faderlandt," and esculents, and other garden vegetables flourish well, and few situations on the islands promise more ample returns to horticultural and agricultural industry than the rich, sloping plain in and around Hilo.

The climate is regular, the earth is blessed with copious rains and fertilizing dews. The hand of industry is not paralyzed by drought, and the people escape the feuds and warfare over water for irrigation, which has been the source of so much trouble in the drier and less favoured islands of the group.

The population of Hilo proper at the last census, as near as can be ascertained, was 1750. Of this, the active business portion is composed of foreigners. The Americans are more numerous; besides the missionaries and their descendants, the highest officials of the city and most of the sugar planters belong to the *genus Yankee*. They are all alike characterised by kindness, urbanity, and hospitality. There is no greater spirit of liberality in the islands than among the American residents of Hilo, and this is exhibited without limitation and on all occasions. May their shadows never grow less, while their purses

elongate. The American population is about 75 of all ages. Equal in number to the Americans—if not greater—the Chinese constitute a very important portion of the population of Hilo. They are generally of a superior class, mostly merchants and men of business, active and energetic. The first Chinese emigrants assimilated and married with the natives; they became a part of the permanent population, and in the rising generation, there is a large proportion of mixed blood, descendants of Hawaiians and celestials. They are handsome, quick, and intelligent, especially the female portion. We particularly remarked their aptitude in speaking English and their general sprightliness. Of the Europeans, we found three Englishmen, three Germans, and three Spaniards. Besides the sunny countenance of Harry, we saw one more radiant phiz to "reprisint the imerald isle."

There are two substantial churches in Hilo. The protestant evangelical church, presided over by the Reverend Titus Coan, is large, indeed sufficiently commodious for the entire population of Hilo. Its modest white spire can be seen rising far above the green foliage of the embryo city. We attended divine worship in this church and were struck with the forcible simplicity and eloquence of the pastor, and the scrupulously polite attention of the native audience. We have never witnessed more dignity or devotion.

The Roman Catholic church is also commodious, well constructed, and roofed with slate. It is finely situated with its white towers and belfries, surmounted by two crosses directly in front of the harbour. Father Carlos Pouzot is piously and devoutly bent on the good of his flock, who seem to appreciate his services with sincerity. Being tolerant of all religious creeds, and in favour of anything that will aid human progression, we sincerely hope that these rival churches will advance the moral and social interests of Hawaii.

The facilities for education are good in Hilo. The Seminary of the Rev. D. B. Lyman, at Punahoa, near the base of the extinct volcanic crater hill of Halai, is prosperous and doing much good to the rising generation. The house is a large two story frame building zinc-covered, in an elevated position overlooking the city and bay, and a wide expanse of variegated plain and ocean, eastward and southward, with a back-ground of grand mountains to the west and north-west. The school is conducted on the manual labour system. The soil is good and the grounds extensive. We saw several acres of taro and other vegetables in fine cultivation. The average number of scholars in attendance at the school of Punahoa, is sixty. The branches taught are rudimentary—reading, writing, arithmetic, grammar, and geography; lessons are also given in English.

The school of Mr. H. R. Hitchcock, for boys and girls, is in a flourishing condition. Here all the rudimentary branches of a good English education, are taught, together with vocal music, in which some of the scholars have made great proficiency; but the sexes should be separated till they are matrimonially joined. This school generally numbers about sixty scholars of both sexes.

The female school of Mrs. Shipman deserves notice and encourage-

ment. It is a boarding-school for female children and young ladies, under excellent management, though small boys are admitted. All the rudimentary branches of an English education are taught, as in the case of Mr. Hitchcock's school. The scholars number about twenty-five.

There are also nine native common schools, including Waiakea and Onomea. So it will be perceived that the rising generation is not without ample means of education.

There are in Hilo eight retail commercial houses with a large supply of dry goods and groceries. Conspicuous among these, are the stores of Captain Thomas Spencer and J. H. Coney, Esq. These gentlemen, besides a general assortment of merchandise, have everything for the accommodation of whalers and other vessels; Captain Spencer has quite an assortment in the ship chandlery line. Chung Hoon and Co., have also an extensive establishment, and there are several Chinese houses, which do a large business. Our friend Mr. Mills, besides being a naturalist, with the finest and largest specimens of native birds we have seen in the islands, has a well assorted retail store of dry goods and groceries. The American Consul, Captain Worth, has also a general supply, in a very advantageous position, fronting the anchorage in the bay. Besides the supplies furnished the shipping, there is an extensive trade with the districts of Puna and Kau, as also the districts of Hilo and Hamakua as far as Koholalele. If there were good roads, and facilities for travelling were greater, the trade that would centre in Hilo would be much more extensive.

There is an iron foundry, where excellent work is turned out by Messrs. Lidgate and Co.; also a turning lathe, where among various useful utensils, poi bowls are manufactured of an excellent kind from the pride of China, which grows large and plentiful around Hilo; and also from the yellow and more solid wood of the breadfruit tree. There are two small mills, a lumber yard, a picture gallery, blacksmiths' and shoemakers' shops, a bakery, a butchery, where splendid beef is supplied, and rarely a liquor shop or barber's pole. We have the proud satisfaction of saying that in three weeks' sojourn we saw no resident of Hilo drunk.

There is one physician in Hilo, Dr. Wetmore, who seems to be practicing his profession with much assiduity, honesty of purpose, and perseverance. He has also an ample drug store. There are no licensed lawyers, but several aspirants to that honour. They are the sapless limbs of the law, without the trunk. The judges are rather juvenile and somewhat *jejune*—judicial proceedings spasmodic.

The history of Hilo is lost in the clouds of tradition. It was anciently the seat of sovereign power in the District of the same name, and continued to be until after the death of Keoua, its last sovereign, when the whole island was governed by Kamehameha I. Its former population was much greater than it is now, although there are fewer evidences of a dense population in ancient times than in any other portion of the Hawaiian Islands. Indeed, we did not see an ancient

temple, or any of those grand works of the old natives, which are seen in Kona and Kohala. The fish pond at Waiakea is the only relic of the past.

The harbour of Hilo, with little expense, could be made one of the safest and most commodious in the Pacific. By constructing a break-water on the reef, northward from the point beyond Waiakea, the harbour would be perfectly safe, land-locked and sheltered at all times. This could be easily effected by building a tram railway, and by means of cars, which could transport the abundant hard, volcanic material near at hand, upon the reef. It is but a short distance to immense beds of basaltic, vitreous and vesicular lava, which would resist the action of water for ages. The convict labour of the island would be sufficient to accomplish the work in a few years, and render Hilo a Port where all the shipping of the Pacific could ride securely at anchor. It is now more capacious than any other bay or harbour on the island, and it is not subject to violent gales from any quarter.

We climbed the volcanic hills beyond the school-house of Punahoa, back of Hilo, through tall, wiry grass, waist high. It was dense and massive as an East Indian or Central jungle, and impassable for a horse. Although the most beautiful look-out and commanding the most extensive view of any point near the coast on the Hawaiian Islands, there is not a path-way leading to it. It requires long extremities, strong flexors and extensors and resolution and perseverance to wade through it. We, however, made the ascent and were well rewarded for our trouble. Hilo lay below us in all its loveliness of rural beauty, a regular crescent around its symmetrical bay, in whose quiet waters three vessels were at anchor; we seemed overlooking a vast irregular and diversified plain extending from the sea on the East to the mountain domes, forty miles distant on the West, and lost in the distance to the North and South. It was dotted with groves, seamed with forests and cleaved with gushing rivers. Between the belts of forest were green, grassy plains, with occasional farm houses and native cottages. Immediately below us and beyond the dashing stream that flows into Hilo Bay, is the Sugar Plantation of Amanulu, belonging to Captain Thomas Spencer. His neat cottage of Puneo, on the rise beyond the sugar mill, in its quiet simplicity stands in the centre of his four hundred acres of cane now in cultivation. The cane was green and vigorous in its growth, and some of it the heaviest and finest we have seen on the Islands. A count of one of the rows showed two hundred canes in 46 feet; they were large, long, and growing rapidly. We do not think there is a more valuable plantation in Hawaii. It lies adjoining Hilo, is well watered, exceedingly fertile, with a fine landing, facilities for *fluming* the cane from any part of the plantation to the mill, with abundance of wood and 3,600 acres of land, the most of it capable of producing sugar cane.

Northward on the coast adjoining Amanulu, is the Kaiwiki Plantation of Melchers and Co. This is also finely situated, the cane flourishing, green and vigorous, abundance of water, and all the facilities necessary to make a good plantation.

Adjoining this is the Chinese Sugar Plantation of Chung Hoon and Co., which seems to be doing well and the cane looks thrifty.

Beyond this is the flourishing plantation of Onomea, of Messrs. Austin and Co. We do not know of a more beautiful plantation, and one that promises a richer reward for the capital and labour bestowed on its cultivation. Dim in the distance beyond this, the Metcalf Sugar Plantation and the rising hill bound the vision.

But scattered everywhere and lying at our feet, are taro patches—the upland taro—growing without irrigation, more vigorously than taro anywhere else in deeply inundated beds. It is the Hawaiian staff of life, and is produced more abundantly and with less labour around Hilo than at any other point. As the "spud" to Paddy, so is taro to the Kanaka, and the plains around Hilo are his Elysian fields—the Arcadia of his "grub" dreams.

There is little cultivation in the ocean bounded plain that stretches toward Puna and Kau. Crown lands and long leases of large lands, have effectually prevented settlement and cultivation.

We stood upon Mount Halai as we sketched the scene, but there are three volcanic cones in a line, with a distinctly marked crater in each. Halai or Punahoa, is the one nearest Hilo; the second is also called Halai, though separated from it by a valley, where there is a kuleana, a halepili and taro cultivation; the third is called Puhanu. The crater of the latter is less distinctly defined than those of the two first, its summit being but slightly concave. They were all mud and water volcanoes. They never ejected scoria and ashes nor streams of fiery lava; but they formed the plain around Hilo, by an eruptive deluge of mud and water. Like the *Volcan del Agua*, or water volcano of Guatemala, the hot, steaming deluge poured over the plain and formed regular layers. These are visible in the unctious, yellow, clayey soil—the silt that was upheaved from beneath in a liquid form. The basaltic formation beneath it came from Mauna Loa, the three lateral mud craters gave it the coating soil, they were but the chimnies or flues through the trap or basalt.

Northwest of the plantation house of Capt. Spencer at Puneo, is another crater cone, surmounted by a *halepili*. This is of the same class as those above described, and its eruptions were of boiling mud and water, which formed the coating of soil over the plain around. But we must leave you here, and write again from Kilauea.

METEORIC SHOWERS.

THE following is the paper on this subject read at the recent meeting of the British Association by Professor A. Herschel, of Glasgow.

Professor Herschel said: Thirty-three years have now elapsed since a committee of the British Association received the recommendation of learned men to include the observation of luminous meteors in their meteorological inquiries. This counsel was given on the occasion

when a grand reappearance of the November star-shower in America awakened a desire in every mind to assist, if good fortune should present such another spectacle in the nightly skies as that with which our transatlantic neighbours from that time and for a long time seasoned their discourses on the marvels of astronomy. With the endless means of intelligence and communication between distant countries now so constantly and easily accessible, the statement of Egen, and the opinion of more modern collectors of meteorites, that one such fragment at least is every day added to the earth's ponderous mass, looks more and more likely to be confirmed. In England and France, with their dependencies alone, five aerolites in four weeks, about two years ago, were reported in the newspapers to have fallen, and portions of the stones were forwarded to the national museums. Whereas, at the beginning of the present century only three fragments of aerolites existed in the Museum of Mineralogy at Vienna; that collection now contains more than 220 specimens of well-authenticated falls. The gallery of mineralogy in the British Museum contains a somewhat greater number.

A question which at present agitates the minds of physical astronomers is to ascertain whether a slight acceleration of the moon's apparent motion can be attributed to a lurking error in the calculations of its place, or whether the earth, in the course of ages, has lost a small portion of its speed of revolution, round its axis. The latter alternative would appear to explain the fact that the lunar tables, which exactly represent the moon's apparent motion at the present time, do not absolutely give the hour of the day of an eclipse which happened when the sun was setting at Babylon some hundred years before the Christian era. The eclipse began, according to the tables, when the sun was already below the horizon, and it would be invisible at Babylon. But, if the earth's rotation, instead of being uniform, were a little more rapid at former times than it is at present, the sun, instead of being set below the horizon of Babylon, would appear eclipsed above it, as the phenomenon was in reality observed. To account for a slower rotation of the earth about its axis at the present time than that which it possessed formerly, the friction of the tides has been supposed to play an important part in checking its velocity.

A slow accumulation of meteorites upon the earth's surface, although not appreciably altering the figure and dimensions of the globe, must yet, in the course of many ages, produce an average effect of diminishing its velocity of revolution. The change of a hundredth part of a second in the length of the day, since the time of the earliest observations, would explain the small error which astronomers have discovered, and the cause of which still eludes their search. In the year A.D. 1719 a meteor of unusual size appeared in England, to which trigonometrical calculations assigned a diameter of at least a mile, a velocity of three miles per second, and a height in the atmosphere of sixty geographical miles. A detonation like thunder shook the houses as it passed. Dr. Edmund Halley, who was then professor of astronomy at Oxford, described the appearance of this meteor.

In the Mineralogical Museum of St. Petersburgh a large mass of metallic iron, weighing about seven hundredweight, had been brought by Pallas, the geologist and explorer, from the summit of the hill of Krasnojarsk, in Siberia, where it was found. The origin of the mass was a vexed question with geologists when, in the year 1794, Chladni published his work on "The Iron Mass of Pallas and other Masses of Iron and Stone Reputed to have Fallen from the Air." In this work Chladni supposes that all the accounts hitherto received of the falls of aerolites were correct, and he presents a catalogue of them, together with all the accounts of large fireballs which he was able to collect. Chladni conceived that a class of cosmical bodies exists in all parts of the solar system, each forming by itself a peculiar concourse of atoms, and that the earth from time to time encounters them, moving with a velocity as great as its own, and doubtless in orbits of very various eccentricity round the sun. Chladni further assumed that a certain property of compressed air, which can be readily exhibited by an instrument called a match syringe, produces the vivid light and heat of combustion which these bodies exhibit when they are first brought into collision with the outer strata of the atmosphere. The passage of a celestial body through the atmosphere must be intensely rapid, so that before the air can make its escape from the front of such a projectile, it must necessarily undergo a violent compression of the kind exemplified in the match syringe—the heat developed on its surface must, doubtless, far surpass what can be produced by mechanical means. A series of accurate experiments was made by Dr. Joule, from which it may safely be concluded that a velocity of transit through the air, which is not uncommonly observed in meteors, of thirty miles in a second, would produce upon the surface of the meteoric body a heat sufficient to fuse, and probably also to volatilise the most refractory substances. Not only the thin glazed surface or crust with which aerolites are invariably covered, but also the appearance of fire-balls and shooting-stars can be satisfactorily explained on these assumptions.

The first astronomical observations of the kind necessary to confirm the theory of Chladni were those conducted by Brandes and Berzenberg at Gottingen, in the year 1798, on the heights and velocities of shooting-stars. It was found that shooting-stars appear at a surprising height in the atmosphere, and move with the extravagant velocity which large aerolitic fire-balls were already known to have. The first indication was thus gained that the shooting-stars are, in fact, pigmy aerolites, and that aerolites are a gigantic sort of shooting-stars. Observations of luminous meteors have now divided themselves into three classes, for each of which a separate investigation leads to the uniform result that the hypothesis of Chladni is the only one which bears upon its face the stamp of truth. In the principal division on the subject (to which Professor Maskelyne has given the name of aërolites), it was shown by Edward Howard, in the beginning of the present century, that meteoric stones differ essentially from terrestrial rocks, by abounding with metallic iron.

But they agree among themselves, by having, in every case which he examined, the rarer metal nickel for an ingredient. Chromium was afterwards shown by Laguer to be an even more constant companion of iron in meteorites than nickel. Copper, tin, and lead, soluble chlorides of soda, potash, and ammonia, carbon in the form of graphite, and once occurring as a carbonacious peat, and in one other case as a volatile substance, have been found in meteorites; but no new element has been discovered which is not already known to exist upon the earth. Quite recently, the Master of the Royal Mint, Dr. Grahame, has found an abundance of hydrogen gas occluded, or stored up, in the mass of a meteoric iron. Among the largest aerolite falls of modern times, two celebrated examples have occurred in France, and two took place in Austria and Hungary. A violent explosion was heard in L'Aigle, in Normandy, and at a distance of eighty miles round L'Aigle, at one o'clock in the afternoon of the 26th of April, 1803; a few minutes before the explosion was heard, a luminous meteor with a very rapid motion appeared in the air, and the explosion heard at L'Aigle was caused by the bursting of the meteor. Two thousand stones fell at L'Aigle upon trees, pavements, and the roofs of houses, so hot as to burn the hands when touched, and one person was wounded by a stone on the arm. The shower extended over an oval area nine miles long and six miles wide, close to an extremity of which the largest of the stones was found.

A very similar shower of stones fell at Stannem, between Vienna and Prague, on the 22nd of May, 1812, when 200 stones fell upon an oval area eight miles long by four miles wide. The largest stones, in this case, were found, as before, near the northern extremity of the ellipse. The third stonefall occurred at Orgueil, in the south of France, on the evening of the 14th of May, 1864. The area in which the stones were scattered was eighteen miles long by five miles wide, and the largest stone was picked up at the eastern extremity of the area. Lastly, at Kuyahinza, in Hungary, on the 9th of June last year, an aërolite, weighing six hundredweight, was deposited, with nearly one thousand lesser stones, on an area measuring ten miles in length by four miles wide. The largest meteors are obviously divided into two classes, one of which, the bolides, or silent fire-balls, appear to have a looser texture, or to consist of more easily inflammable substances than the rest. They burn very brightly, but without producing an audible concussion of the air. Several true bolides accompanied the last November star-shower. Aërolite fire-balls, as their name implies, frequently precipitate solid stones upon the ground. Fire-balls of this class are accompanied by a detonation. Four such fire-balls have happened within the last few years, on or about the 20th of November. The list of fire-balls observed hitherto numbers some thousands, and as far as their appearance in comparison with certain shooting-stars is concerned, the latter present a dwarfed resemblance to the former, so that it is probable no break exists, but that fire-balls of every kind are shooting-stars of a larger stature. The progress of knowledge regarding shooting-stars may almost be identified with the history of the

November star-shower. That great apparition which took Humboldt and Olmsted by surprise in 1799 and 1833, has met the gaze of thousands unable or unwilling to speculate upon its nature. But no suspicion of its periodicity could then have crossed Humboldt's mind, for want of a statement of the month and day. On the 13th of November, 1832, and again on the 13th November, 1833, the shower re-appeared, at first in Europe, and the second time in full magnificence in America. No doubt of its periodical character could after that time exist.

A point of capital importance was also discovered on that occasion, which distinguished the great November star-shower from all other exhibitions of meteors that had been previously observed. Instead of clashing together, as too many old accounts of their appearance might, perhaps, lead us to imagine, the November meteors in 1833 shot outwards in smoothly-flowing lines from a single centre of emanation in some part of the constellation Leo. The position of the radiant point in Leo was by no means unanimously fixed by different observers. Olmsted thought it near the star γ Leonis, but Professor Twining placed it in the centre of Leo's sickle, close to the small star $\varkappa$ Leonis—the identical spot where observers agreed in placing it during the November star-shower in 1866. The fixity of this point among the stars was, in the opinion of Professor Twining, sufficiently distinct to enable him to recognize that at this juncture the earth passed through a vastly extended system of meteoric bodies entirely independent of every terrestrial agency, and yet moving in entire harmony and concert—in short, that each November meteor had an orbit, and that in their orbits they were all revolving together round the sun.

It was soon after this that Mr. Quetelet, of Brussels, formed a catalogue of all the ancient records of star-showers that he was able to collect, in order to discover in them any signs of a periodical character that might exist. He succeeded in predicting the return of the meteors of St. Lawrence on the 10th of August, 1837, which have since been the most constantly observed of star-showers. The radiant point of this shower is not far from the sword-handle of Perseus. The result showed that other periodical star-showers might probably be looked for with success, and one which took place at Richmond, U.S., on the 20th of April, 1803, was watched for by Hewick in America, and was found to resemble that which from time to time appears on the 2nd of January, by great uncertainty in its returns. Its radiant point he found to be near Omega Lyræ. The other date when meteors are supposed to be most plentiful is the 2nd of January, when the meteors have a radiant point near the right knee in the figure of the constellation Hercules. A moderate shower of meteors is seen every year on the night of the 12th of December radiating from the neighbourhood of Castor and Pollux. Finally, on or about the 19th of October a tolerably well-marked shower of meteors has been seen during the two years, radiating in a very different manner from Orion.

It is an interesting discovery in the familiar phenomenon of shooting stars, perhaps too long neglected, as Mr. Quetelet remarks, by astronomers, that if their number seen on any night, by one person, much exceeds fifteen per hour, the appearance generally indicates a special shower; and a very moderate amount of attention to their apparent tracks among the stars in general suffices to determine the fixed centre of radiation from which they diverge. From the records of scattered observations, extending over more than twenty years, the Luminous Meteor Committee of the British Association believe that they have traced the existence of at least fifty periods of such occurrences during the twelve months of the year, with the positions of their connected radiant points.

A study of ancient appearances of the November meteors led Professor Newton, of Yale College, U.S.A., to anticipate their reappearance on the morning of the 14th of November last. The interest of astronomers was awakened by the seasonable appeal in good time for preparations to be made in almost every quarter of the globe to note the re-appearance of the shower. The area of its visibility extends from the British Isles to India in the east; and from Europe in the northern, to the Cape of Good Hope in the southern hemisphere. This was exactly the district occupied by the same shower at its appearance in the year 1832, and it may be expected that this great shower, like that of 1833, will this year be again visible in America on the morning of the 14th of November next. But, in that case, it will be only partially visible in Europe. The position of the radiant points, as well as the moment of the maximum abundance, was distinguished with great precision at the Royal Observatory, Greenwich, and, compared with observations at other places, leaves nothing to be desired in respect of philosophical exactness. The moment of maximum frequency, observed at the Cape of Good Hope Observatory, shows that South Africa, on account of its high southern latitude, entered the densest portion of the shower about fifteen minutes earlier than the same phase of the shower was witnessed in the British Isles, while the total duration of the shower, at all stations, shows that the greatest thickness of the stream of meteoric bodies through which the earth passed in two hours, was about thirty thousand miles.

A most curious incident connected with these discoveries is, that a comet detected by Tempel shortly after the first outposts of the November meteors made their appearance in 1865, to which an elliptic orbit, with a period of thirty-three years and a quarter, was assigned by Oppolzer, before the recent display of the November meteors was discovered, is found to move in exactly the same orbit with the meteoric bodies, throughout their entire revolution round the sun. A coincidence so unexpected, and against which the probabilities are *d priori* so enormous, must alone make the physical connection between Tempel's comet and the groups of meteoric bodies little less than certain. But the astronomer of the Brera College of Milan, Signor Schippaoelli, had already published the announcement in a letter

written previously to this discovery to the Padre Section, that the orbits of the St. Lawrence's meteors of the 10th of August, which he supposes to be nearly parabolic, must in that case coincide almost exactly with the long elliptic orbit of a very conspicuous comet, known as Swift's or Tuttle's comet, which appeared in August and September, 1862. A similar inquiry has since been made by Dr. Weisse regarding the orbit of the group of April shower-meteors, supposed, like the former, to be nearly parabolic; and this is found to coincide almost exactly with the long elliptic orbit of a bright comet which was visible for some weeks in the month of June of the year 1861.

Shower-meteors thus continue to engage greater attention by the light which their new-found relation to those most mysterious messengers from distant space may throw upon the obscurity of the phenomena of comets. The spectroscope has been turned with some success to analyse their light, and it was found by Mr. Huggins that the nucleus of Tempel's comet was self-luminous, shining with a single ray of bluish light, while the pale light of the envelope consisted of the sun's reflected rays. Spectroscopes of the best form that could be devised were turned towards the streaks of the November meteors, and in some of those were also recognised a single ray of a lavender blue, or of a greyish colour. It is not impossible that the meteoric particles are portions of the comet's tail, shreds of a dismembered mist, torn by the sun's disturbing action from the nucleus of the comet, and left upon its path like embers, or smoke-flakes in the track of an expiring flame. But is the heat of their collision with the atmosphere sufficient to restore a portion of the luminous appearance with which she shone in the nucleus of the comet? are the November meteors and Tempel's comet perfect nebulæ undergoing condensation; of which the meteoric bodies are the quite faded stars, and the cometary nucleus is the still gaseous and self-luminous portion of the nebulæ? When the bright and persistent character of the cometic portions of the November meteor streaks is borne in mind, the telescope armed with the spectroscope may still enter the field on the eventful morning of the 14th of November next. An answer will then, if possible, be given to questions which as yet hardly admit of being rightly framed, so unexpected are the revelations and so novel are the conceptions which a few short months have introduced into the rapidly advancing theatre of meteoric astronomy.

A Short Lunar Method.

My dear Sir,—I discovered lately a very short Lunar Method, which is rigorous and does not require any special tables beyond those already given in Norie's Epitome or Inman's Nautical Tables. The rule is:—"Subtract the natural versed sine of the difference of apparent altitudes

(both to the minute) from the nat. versine of the app. distance, call the remainder R.

Double the last four figures of the nat. versine of the "auxiliary arc" (Norie's XXX., or Inman's w) answering to the Moon's alt. and her parallax; and find the logarithm of the product, (its index is found by adding 3 to the number of figures in the product) and call it "log. N."

Then subtract from R the natural number corresponding to the sum of the log. N. and the logarithm of R, and to this remainder add the natural versine of the difference of true altitudes, and the sum will be the nat. versine of the true distance.

Note.—In taking out the nat. versine of the app. distance, it will be well to omit the "seconds" to be afterwards added at the conclusion of the work.

Example.

App. distance = 51° 28′ 35″.—Hor. Par. 56′ 15″

Moon's AA	12° 30′	Corr. 50′ 39″	Aux. Arc = 60° 6′ 8″
Star's AA	24° 48′	2′ 5″	vers. .. 1546

N = 3092 (double)

App. Dist.	51° 28′	vers. 377030	
Diff. of alt.	12° 18′	vers. 22954	log. N = 7·4902
		R = 354076	.. log. = 5·5491
		−1095	= log. 3·0393
Diff. true alts. =	11° 25′ 16″	.. vers. 352981 19786 16	
	51° 9′ 17″	= vers. 372783	
Seconds omitted	35″		
	51° 9′ 52″	= True distance required.	

The above is Dr. Brinkley's method, printed many years ago, but I have disencumbered it of its special tables and of the complicated calculations to get the "N." In this example I made use of Inman's Tables.

I remain, Sir, etc.,
E. H. HEBDEN, JUN.,
Scarborough.

July 4th, 1868.

To the Editor of the Nautical Magazine.

The Sandwich Islands. *Late Volcanic Eruption.*

In the June number of the *Nautical* we noticed the recent eruption of the great volcano of Owhyhee (or as now written from French spelling Hawaii) one that seems to have surpassed all others (within memory) of that enormous seat of volcanic action, as much as that does itself all our European displays of that nature. In our last year's volume our readers will remember the historical account of the eruptions of Mauna Loa, the huge mountain formation of Owhyhee, the last of which occurred in the year 1859. The present year of 1868 seems to have produced another of far greater intensity than any that have yet occurred, and to have been attended with loss of life to man as well as animals to a very much greater extent.

The first connected observations of the eruption appear to have been made on the 27th of March, although symptoms of it seem to have shewn themselves previously. It appears from the accounts of it in the principal paper published in the Sandwich Islands to have formed the finest spectacle ever seen at those islands, in the course of which a river of liquid lava was flowing down the mountain on its southern side to the sea at a rate of ten to twelve miles an hour;—that a new crater has been opened of two miles across, and masses of rocks and jets of lava thrown up to a height of a thousand feet from the volcano, which itself is above two miles in height, above the sea;—and the lava has formed lakes which cover some of the best land at the southern side of the island.

The stream of lava seems to have taken a southern direction entering the sea not very far from the south point. Many of the places named in the following, which has been selected from the letters published on the spot, will be found on the little chart in our last year's volume.

A letter dated Sunday, the 29th of March, says: "At about eight o'clock Friday evening we felt a slight shock of an earthquake; this was the first and possessed some novelty. Since then we have had no less than three hundred! At this time a feeling of absolute terror prevails. The past forty-eight hours has compassed more of the terrible than one usually experiences in a lifetime. The most severe shock took place at a quarter to two o'clock yesterday afternoon the earth moved like a troubled sea."

Another says: "The sea came in yesterday, 2nd April, and washed up to and over the Waiakea bridge and up to the King's fish-ponds, carrying away the walls in several places. The sea came in at Keauhou and Apua, and carried away all the houses. At Keauhou the natives escaped by running. It is feared that the natives at Apua were not so fortunate."

These however, were not the only places which suffered as the following will show. The first letter is dated Kealakeakua Bay, 8th April, called Karakakua on the western side of the island.

KEALAKEAKUA BAY, April 8th—12M.
WEST SIDE OF OWHYHEE.

We reached here this morning at 9 o'clock to find a scene such as our hitherto favoured islands have not witnessed since the feet of foreigners touched their soil.

The earthquake of Thursday the 2nd of April in the afternoon, which was felt so distinctly on Oahu, Maui, and Kauai, as to destroy many lives, and even whole villages.

At *Honoapo* (which is midway between *Waiohinu* and *Punaluu*) sixteen natives were killed by the earthquake and tidal wave which followed it, and swept them off into the sea. Only two houses in the village were left standing.

At Kealualu (the port of *Waiohinu*) several lives were lost by the tidal wave.

At Punaluu, three deaths from the same cause. The village of Waiohinu is all in ruins, and about twenty lives are reported as lost.

All the churches in the Kau district (except one or two frame houses) are prostrated. Mr. Pogue estimates the deaths in the Kau district, as heard from, at over one hundred.

In Paliuka (a few miles beyond Waiohinu) there were twenty deaths from the earthquake and thirteen from the tidal wave—thirty-three in all.

The eruption or lava flows commenced yesterday, and one stream is flowing into the sea about half-way between *Kapua* and the South Point. Another stream is flowing on the Puna side, that is said to consist of mud and sulphurous water only. Mr. Lyman and family have left for Hilo.

Our company will start to-night in a sloop now lying here and sail down the coast, as we deem it safer than to go overland, and as more likely to furnish the best view. We hope to find the lava stream to-morrow flowing into the sea. We shall then go on to Waiohinu, so as to see and report from actual observation the condition of things.

At midnight (last night) we could clearly see the *lava stream* from the steamer, flowing down the mountain side, and the whole mountain illuminated as if a large city was burning.

P.S.—A person just in from Kau, near Kahuku, brings the following authentic report of the killed and drowned: at Paliuka, 33; *Makaka*, 13; Punaluu, 4; at *Honoapo*, 27; Kamilo, 3—total 80. More, probably, will be found missing.

The greatest consternation exists through the entire Kau district, and even here in the Kona district. But as the shocks have sensibly decreased, and the flows have begun, it is probable that the worst is over.

The tidal wave referred to is stated by the natives to have been some ten or twelve feet above the usual height. Then it receded at least eighteen feet (three fathoms) below low water mark. The great return wave swept most of the houses from the beach and drowned many. The sea rose and fell *eight* different times.

This whole island is enveloped in smoke, so that it is impossible to see over two or three miles in any direction, and at times hardly half a mile.

We may be compelled to go on around to Hilo, but shall hope to get back to this point in time to meet the next week's steamer.

At *Waiohinu*, on the road to *Kiolakaa*, a crack has opened from one to seven feet, extending to the beach and mauka as far as the eye can reach. One remarkable feature of this is, that the ends of the road, at the chasm, are not opposite each other, one side having moved the width of the road mauka or makai.

The southeast side and summit of the hill at *Kiolakaa* was thrown a distance of a thousand feet over the tops of the trees, landing in the valley below, the turf covering the hill apparently undisturbed.

It is estimated that a thousand animals (horses, cattle, goats, and sheep) were destroyed at Keaiwa, from the poisonous gases which issued from the hill at the time it was thrown down.

On Kahuku, back of the church, is a hole sixty feet in diameter, the bottom of which cannot be seen.

The tidal wave swept over the tops of the cocoanut trees along the whole line of the coast.

At Keaiwa, a land slide occurred which buried thirty-three natives.

Over fifteen hundred shocks of earthquake have been experienced within the last ten days.

Letter from Kau.

Waiohinu, Kau, Hawaii, April 3rd, 1868.

Dear Sir,—Kau is in mourning. The glory is departed. The Lord's hand is upon us. Our village is almost in ruins. As I wrote to you in my last we were having a succession of earthquake shocks. These continued in number and strength. Yesterday, at a quarter to four o'clock, we had a shock which sent destruction and death throughout the district. As many as *twenty* deaths have been reported, but I think this may be exaggeration. By a tidal wave *sixteen* were said to have been swept away and lost from one village. This may be so, but I doubt the truth of the statement. *All our churches are prostrated.* Our house is a perfect wreck. We have left it and moved into the house built by Capt. Crane.

Last night there was a report that a flow of lava was coming down upon us at Waiohinu, which caused us all—small and great, native and foreigners—to leave the place. This proved, however, to be incorrect. No such a flow was seen—a native report. What we have suffered in the last week or ten days no one knows. May the Lord sustain us, and help us to trust Him always and ever. Much of our furniture is among the ruins of our houses. Our dwelling house has not fallen, and probably will not, but is a perfect wreck.

April 6th.—The number of deaths mentioned above is not exaggerated, but is too small altogether. I should not be surprised if the whole number of deaths in Kau will come up to *one hundred.* Thirty-seven deaths are reported in Paliuka alone. * * * *

As ever yours, J. F. Pogue.

P.S. The Rev. S. S. Bishop says, from an observation taken by him at Lahainaluna, that the column of smoke which rose from Mauna Loa, on Wednesday morning, reached an altitude of seven and four-fifth miles before fanning out.

This morning as we write, the atmosphere is thick with smoke, the sun appearing like a ball of fire. The eye was not pained in looking at it even after it was two hours' high.

KEALAKEKUA, HAWAII, Monday, April 13th.

My last was from this place, but I have since been to the lava flow, and witnessed the most grand, brilliant, and awe-inspiring scene probably ever afforded to the people of these islands. My pen shrinks from giving the details of what is almost indescribable, and what needs to be seen in order to be fully realized.

We left Kealakekua early on Thursday morning (April 9th) a party of ten, not including guides, etc., and followed the old *aa* road through the Kona district. I cannot stop here to speak of our dinner at Kuaimoku's, or our night's rest at Mr. Spencer's half-way house at Kapua, nor of the tedious journey of forty-five miles, or the way-side incidents—all which may form the subject of another letter—but will bring the reader at once to the brink of the lava stream, which we reached at two P.M. on Friday, the 10th.

On ascending the ridge just west of and opposite the Mamalu Pali of Kahuku, and which was separated from us by a valley about one-eighth of a mile wide, the whole scene opened before us in one grand panorama. The valley itself was floored over with a pavement of fresh *pahoehoe* lava, from ten to twenty feet deep, which appears to have been the first thrown out, and came from a crater about ten miles up the mountain, which burst out on Tuesday morning, April 7th. This crater and stream had ceased flowing, and the lava was rapidly cooling, so that we ventured to stand on it, though at the risk of burning our boots and being choked by the sulphurous gases.

On Tuesday afternoon, at five o'clock, a new crater, several miles lower down, and about two miles directly back of Captain Brown's residence, burst out with a heavy roar and frightful crash. The lava stream commenced flowing rapidly down the beautiful plateau, towards and around the farm-house, and the inmates had barely time to escape with what clothes they had on, before the houses were all surrounded and enclosed with streams of fiery *aa* lava, varying from five to fifty feet in depth. Fortunately all the inmates escaped safely to Waiohinu, but how narrow the escape was, and how rapid the stream flowed, may be inferred from the fact that the path by which they escaped was covered with lava within *ten minutes* after they passed over it.

The new crater, when visited by Mr. Swain, was at least one and a half miles in extent, nearly circular, but constantly enlarging its area, by engulphing the sides. While the above gentleman was looking at it, a tract of at least five acres in extent tumbled in and was swallowed up like food for the devouring element. The enlargement is going on

mainly on the lower side, towards the farm houses, and it is thought that its diameter is already about two miles.

Four huge jets or fountains were continually being thrown up out of this great crater, ever varying in size and height, sometimes apparently all joining together and making one continuous spouting a mile and a half long.

From the lower side of the crater, a stream of liquid, rolling, boiling lava poured out and ran down the plateau, then down the side of the pali (following the track of the government road), then along the foot of the pali or precipice five miles to the sea.

This was the scene that opened before us as we ascended the ridge on Friday. At the left were these four grand fountains playing with terrific fury, throwing blood-red lava and huge stones, some as large as a house, to a height varying constantly from 500 to 1000 feet. The grandeur of this scene no imagination can picture—no one who has not seen it can realize.

Then there was the rapid, rolling stream, rushing and tumbling like a swollen river, down the hill, over the precipice and down the valley to the sea, surging and roaring like a cataract, with a fury perfectly indescribable. This *river of fire* varied from 500 to 1200 or 1500 feet in width, and when it is known that the descent was 2000 feet in five miles, the statement that it ran at the rate of *ten miles an hour* will not be doubted.

We waited till night, when the scene was a hundred fold more grand and vivid—the crimson red of the lava doubly bright; and the lurid glare of the red smoke clouds that overhung the whole, the roaring of the rushing stream, the noise of the tumbling rocks thrown out of the crater, and flashes of electric lighting—altogether made it surpassingly grand.

This ever varying, ever-changing pyrotechnic display we watched for hours—some of us all night. I took a sketch on the spot, which I send you and only wish it could be inserted in the paper as sent. It can give only a faint idea of this grand scene.

Finding it impossible to get over to Waiohinu, either by going up the mountain or by sea, we returned to this place on Saturday, and hope to go on soon by steamer. From the Kau side the scene is even more beautiful than what we had, as there visitors can get up very near the crater, and also directly over the lava stream. Another advantage of the Kau side is, that the visitor is not exposed to the strong sulphurous gases and smoke.

From several of the residents of Waiohinu, I have learned a number of interesting facts, which may be inserted in this communication.

The number of shocks which occurred at Waiohinu from March 29th to April 10th, is estimated by Mr. Silloway to have been upwards of *two thousand;* there having been some days between three and four hundred. The heaviest shock occurred on Thursday, April 2nd, being the same that was felt so sensibly at Honolulu. This destroyed every church and nearly every dwelling in the whole district.

From ten to twelve o'clock of that day there had been service in the

large church in Waiohinu, and it was crowded with people. Only four hours after they left the heavy shock came, the walls tumbled in, and the roof fell flat—all the work of twenty seconds.

At the same instant, every man, woman and child was thrown off from their feet. Horses and cattle dropped down, as if dead. A man riding on horseback had his horse tumble under him so suddenly that he found himself and horse lying flat on the ground before the thought of an earthquake entered his mind.

The earth opened all through the district, and in some places caused dangerous fissures, while in others it closed up again. In one place it closed twenty feet from where it opened. These fissures make it dangerous to travel in the dark. Everywhere the roads are broken up and it will take much money and labour to restore them to their old condition.

The new Government road made by Mr. Martin has not been injured, the lava not being within a mile of its south extremity.

As the *Kona Packet* was passing the south Point of the island, about three miles from the shore, a conical island, four hundred feet high, rose out of the sea, midway between the vessel and the land, emitting a column of steam and smoke. The lava river flows into the sea at this island and has extended the shore out to it one mile at least, so that it is now on the main land. The packet was so near when this island burst up, that the mud was spattered on the masts and sails of the vessel.

The scene at the eruption was a most melancholy one to witness, There were hundreds of fine cattle grazing around the farm houses, when the lava streams surrounded them and hemmed them in. The poor animals seemed aware of the danger, but saw no way to escape. The fiery lava drew nearer and nearer till the heat made them restless. but they would not run. They bravely looked the fiery foe in the face, stood firm till it reached them, then fell in the stream—a sudden cloud of smoke followed and not a sign remained. Thus one after another fell till over two hundred were consumed.

A fine horse was fastened with a rope to a stake, when the lava approached, burnt the rope, and the animal, with almost human instinct escaped between two lava streams, and was saved to his owner.

An incident which ought not to be omitted is the shower of ashes which preceded the eruption. During Monday night, prior to the eruption, the ground throughout the district was covered with a coating of fine sand and light pumice stone, of a light yellowish colour. Where this shower of sand and pumice stone came from is as yet unknown, but probably from some vent hole near the crater.

The sufferings and alarm experienced by the residents of Kau during the two weeks that the earthquakes and eruption continued prior to their leaving, appear to have been great. Night after night, they were compelled to sleep on the mountain ridge back of the village, exposed to the cold and damp winds and rain from the sea, subsisting on taro and fishes when they could get these, or fasting when they could not.

The whole district is in ruins, *a field of desolation*, and probably five hundred thousand dollars would not restore it to what it was a month ago. It is no wonder that the foreigners are leaving the place, with the intention of never returning to it again.

The number of deaths will be between eighty and one hundred, as stated in my last letter. The exact number may not be known for some time, as some persons are missing whose absence may yet be accounted for. The loss of life is melancholy indeed, and the sympathy of the Hawaiian people, I trust, will be deeply expressed in some way to the mourning and bereaved families of Kau, whose tender ties have been so suddenly and keenly severed by the hand of God.

The tidal wave referred to in my last was much greater than then stated. It rolled in over the tops of the cocoanut trees, probably sixty feet high at least, and drove the floating rubbish, timber, etc., inland a distance of a quarter of a mile in some places, taking with it when it returned to sea, houses, men, women, and almost everything moveable.

But I must close this letter in order to get it on board the *Kona Packet*, now ready to start.

Adieu, H. M. W.

Interesting from the Island of Hawaii.

We have been permitted to read a letter from F. S. Lyman, Esq., of Kau, and make the following extracts as of unusual interest to our readers. Under date of March 31st he writes:

"We still live in fear and trembling, not knowing what may come next. You may have already heard that an eruption broke out on Mauna Loa, a little to the south-west of the summit, about 6 o'clock last Friday morning, 27th instant. It gave no forewarning; the fire burst up out of the ground, throwing a spray of red lava high in the air, then a great column of smoke rose straight up thousands of feet and arched over to the east. In a few minutes a new jet was thrown up a little S.E. of the first, with its column of smoke; soon followed by another jet; and then by a fourth; soon the red lava began running down the sides of the mountain in four streams in a southerly and easterly direction. About seven o'clock we began to hear a roaring sound, which grew louder and louder until the air seemed to tremble with the incessant roar of the volcano; but it finally subsided, and ceased entirely about eight o'clock.

"Saturday morning (28th March), we could see smoke, and the flow had apparently run about ten miles due south from the source; but during the day and part of the night it was covered with clouds.

"Sunday morning (29th March), the line of smoke had advanced about fifteen miles, since the morning previous, and seemed to be directly 'mauka' of Captain Brown's place on Kahuku, but what seems singular, from the beginning, no light has been seen from it anywhere, excepting at the source and what was first seen to flow, only the line of smoke has been visible since with an occasional vision of light at the source.

In the forenoon of Friday, the day the volcano broke out, we had quite a sprinkling of Pele's hair.

The sensations of the hard earthquakes are peculiar—first are the hard shakes, then a swaying motion, as if the whole island were swaying back and forth and we with it."

(To be continued.)

THE CHARTS OF THE LAST CENTURY, AND THE BRITISH CONSUL AT CADIZ.

MR. EDITOR,—In your last number, page 394, you have preserved a letter from the British Consul at Cadiz, complaining of the incorrectness of the charts of the coast from Cape Finisterre to Cape St. Vincent.

Let me first observe that nine-tenths of the coast alluded to is Portuguese! *a damper* this to all expectations of chart improvement. Any one who knows anything of charts of the European coasts, knows full well that the piping times of peace have been turned to good account by every other country but Portugal.

The French, the English, the Dutch, the Danish, the Prussian, the Norwegian, and the Russian governments, have all turned out of hand the most elaborate charts, in full detail of every portion of their coasts and their approaches. Even the Spaniards have done something on their northern shores. But as for the Portuguese, while they have been profiting by the beautiful charts of all the above mentioned governments, they have literally done nothing! Look at the estuaries of the Douro and the Tagus, those two principal markets of their trade. The very charts that are used by all the world, and even themselves, are the produce of British officers. British energy, skill, and daring have furnished the ships of all nations with the means of seeking their trade, while the lazy, idle, useless Portuguese have left their rock-bound coast to be the bugbear of every navigator from the days of old *Pimentel* (their chart maker of last century) until now, unheeded and uncared for. Full as it is of rocky indentations, we know as much of it now as in the days of Columbus: and all the representations of our Consul, or our government, will not move Portuguese apathy. A Portuguese maritime survey! A Portuguese chart fit for these advanced days. You may as well look for the millennium!

The Burlings are alluded to by our consul. It is quite enough to say they are Portuguese too!—neglected of course, and unknown. Happily they have no attractions, but of their approaches by sea, as well as those of the whole Portuguese coast—what do we know of them? literally nothing! In fact the mariner (of whatever country he may be) has nothing to thank the Portuguese for, with their vaunted maritime school of antiquity. They would even have stopped Columbus if they could have done so. So much for Portuguese charts, who ever heard of a maritime survey by Portuguese, from which charts are constructed. The consul may look long indeed before he will see one made of the Portuguese coast.

But the consul alludes also to Spanish lights, and speaks with but little truth, when he complains of two lights of similar character being but

five miles from each other. Such is not the case with Cadiz and Chipiona for they are fifteen miles apart. Some seamen, however, cannot discriminate between them in these days, for he says at a distance of ten miles or so, they cannot see the difference between a *fixed* light, which be it known gives a *red flash* every *two* minutes, and a revolving light which disappears once every minute. So the consul is mistaken in the former, which is that of Cadiz, and agrees that seamen are right in mistaking it for that of Chipiona, and would have one of them altered. Did he perceive the announcement of the intended light at Rota? That might have modified his recommendation.

And again, when in his letter to the government he launches into the currents, etc., between Capes St. Vincent and Trafalgar, was he aware of the elaborate paper on that subject by Senor Tudury, printed in the last Annuario (1867)? and issued from the Hydrographic Office at Madrid? Surely Mr. Dunlop in his official capacity as consul should be acquainted with the *Annuario!* especially when he writes officially to our government, and says, "The currents between Cape St. Vincent and Trafalgar are *very unaccountable and peculiar, nor does it appear to* ME that up to this time any careful system of observation respecting them has been accomplished!" If such a work as the Annuario of Madrid (a work expressly for the improvement of the chart) has not come within the horizon of Mr. Dunlop's observation in his capacity of consul at Cadiz, how could one expect that the translation of that important paper by a seaman (published in the three last numbers of the *Nautical Magazine* of 1867, and concluded in the January number of the present year) could possibly have fallen under the notice of Mr. Dunlop? And yet therein the currents are all described. There must be but a poor look out from the consul's office at Cadiz, when such a publication as the *Annuario* by the Spanish government, could not be known to him, and although the information for which he is looking goes into four numbers of this work, it is to him something like those unfortunate things alluded to in the lines

> "Where many a flower is born to blush unseen,
> And waste its sweetness in the desert air."

Yes, there stands the best account I have yet seen of the currents and winds between "Capes St. Vincent and Trafalgar," and the whole Strait of Gibraltar, that did not appear to Mr. Dunlop, although unfortunately for him it was published at Madrid, and here in London long before his complaint of "any careful system of observation respecting them" was made. Even the little Admiralty List of the Lights on the Coast of Spain would have informed Mr. Dunlop that a Fixed Light (p. 28 and 29) is contemplated at the Mole of *Rota*, by the erection of which all his complaint about mistakes between the lights of Chipiona and Cadiz would be quite unnecessary, and he would have saved himself much trouble in exposing to the world not the necessity of attending to his misrepresentations, but his utter ignorance of what is going forward about him; and which, in his capacity of British consul, as concerning the safety of British shipping in his immediate neighbourhood, it would have been to his credit to have pointed out to his government instead of writing to that government the useless letter to which I have alluded.

I am, etc., ARION.

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 394.)

Name.	Place.	Position.	F. or Fl.	Ht. in Ft.	Dist seen Mls	Remarks, Bearings are by Compass.
60. Moreton Bay Entrance	Yellow Patch	Middle Channel	F.	49	10	Visible when bearing from S. ¼ W. to 26 N. (round by E.) See Note 60.
61. Barrels Rock	Off Wexford	... ...	...	...	...	Buoy. See Note 61.
62. Cheribon Roads	Java	N. Coast	F.	...	...	Est. 1st July, 1867, on ex. of North Mole.
63. Bank off	The Cape of Good Hope	... ...	...	...	...	See Notice 63.
64. Turks Is. Passage	Shoal South of	20° 51′ N. 71° 29½′ W.	...	...	...	Reported by Commander C. A. J. Heysham, H.M.S. *Fawn*, and named the Fawn Shoal. Position approximate.
65. Breakers	Indian Seas	17° 38′ S. 154° 43′ E.	...	...	...	See Notice 65 of the Admiralty and p. 356 of last number (July).
66. Darien Rock	East of Trinidad	10° 35′ N. 60° 38′ W.	...	...	...	See Notice No. 66.
67. Smyrna Light vessels Beirut Anchorage	Alteration	of Position	...	...	...	See Notice No. 67.
68. Pearl Rock	Off Cabrita Point	... ...	...	...	...	See Notice No. 68.
Pianosa I.	East Side	42° 35′·1 N. 10° 5′·7 E.	A.	140	17	Est. 15th July, 1868. Alternating a white and a red light, each continuing one minute.
Corfu and Paxo I. buoys	Madonna Shoal	Do not exist	...	...	...	Also that the Corfu light is scarcely to be seen.
69. Red Sea	Lights and	Buoys	...	...	...	See Notice 69. All removed.

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

No. 60.—The tower is hexagonal, 43 feet high, white, and stands W. ⅛ N. from Cape Moreton lighthouse, and 30 yards from high-water mark.

Also at the same date, that the Comboyuro light will be obscured between the *red* light outside the east banks, and the white light inside the Inner Middle channel buoy.

Directions.—After rounding Cape Moreton, bring the lighthouse on that cape, Yellow Patch lighthouse, and the roadway on the slope of Lighthouse hill, in line bearing E. ⅛ S.; keep these marks on until the Inner Middle channel buoy is passed, and the Ship Patch comes open

westward of Cowan Cowan point; then proceed toward Yule road. The eastern buoy of the Middle channel is red, and also those on the north side of the channel, whilst the buoy on the Knoll is black.

At night, after rounding North point and sighting Comboyuro point *red* light, steer for it until Cape Moreton and Yellow Patch lights are in line; then steer about W. ¼ N., keeping the latter lights in line until Comboyuro *red* light is obscured and the white light seen bearing S.S.E.; when steer South, making due allowance for the tide, until Cowan Cowan light is open, and proceed up the bay as before. The Cowan Cowan light leads clear of the western edge of the Venus bank.

These directions will lead over the East bank, and to the northward of the Knoll, in not less than 3 fathoms at low water.

(*All Bearings are Magnetic. Variation at Moreton Bay* 9° 45′ *East in* 1868.)

No. 61.—The buoy lies in 15 fathoms at low water springs, 1½ cables S. ¼ E. from the rock, with Nethertown house in one with the Coastguard station on Carnsore point; Blackrock in one with Castle ruins; Tuskar lighthouse bearing E. ¼ N. distant 7½ miles; and the beacon on North Saltee island W. by N. ½ N. 7½ miles.

No. 63.—Heavy breakers, during bad weather, having been reported by the keepers of the Cape of Good Hope lighthouse in a north-westerly direction, an examination made by direction of the Commodore at Simons bay, shews that:—

The breakers are on a rocky ledge, about a mile across, from 1½ to 2 miles from the shore, having 10½ fathoms on its shoalest part (near a depth of 11 fathoms already marked on the chart), gradually increasing to 20 fathoms on its outer edge, and 18 fathoms between the ledge and the coast.

From the Ledge	The Cape lighthouse bears	S.E. ½ S., 6½ miles.
	Polesberg -	E. by S.
	Slangkop point -	N. by E. ¼ E., 10 miles.

The ledge is in the fairway of vessels passing along the coast to and from Table bay, and as in southerly gales, a line of breakers has been observed to extend between it and the shore, vessels are cautioned not to approach this part of the coast in bad weather.

Bearings are Magnetic. Variations 30° *Westerly in* 1868.

No. 66.—*Darien Rock, East of Manzanilla Point, East Coast of Trinidad.*—The steamer *Darien*, Captain Gilbert Pierre, on her voyage from Demerara to Trinidad, on the morning of the 6th June, 1868, distinctly saw from the deck, at a distance of about 30 yards, a rock about 15 or 20 feet in extent, with from 2 to 3 feet water over it, and showing occasionally, in the hollow of the swell, two pinnacles. The *Darien* remained some time near the rock.

The position of the rock which had been previously noted in the Chart is said to be lat. 10° 35′ N., long. 60° 38′ W., but as H.M.S. *Gannet* has lately discovered a bank having as little as 11 fathoms water, about 4 miles to the southward of the assumed position of the rock, it is deemed possible that the rock may be a portion of this bank, and therefore its position, as given by the *Darien*, must not be implicitly relied upon.

No. 67.—*Alteration of position of Hermes and Sanjak Light vessels.*—In consequence of the decreasing depth of water in which the Hermes and

Sanjak light vessels, at Smyrna, were moored, it has been considered necessary to move them, and the intended alteration in their positions was to take place on the 28th May, 1868, as follows, viz.—

The Hermes light vessel was to be moored in 10 fathoms water, 120 yards south-west of her late position.

The Sanjak light vessel was to be moored in 6 fathoms water, 66 yards to the north-east of her late position.

SYRIA.—*Anchorage at Beirut.*—One of H.M. Ships, at anchor off Beirut, on the coast of Syria, having suffered from heavy rollers from the N.W. after a fresh wind from the S.W., Mariners must remember that the roadstead is much exposed from West to North, and between the months of November and March, if strong S.W. gales, veer to the northward of West in the squalls, vessels should be prepared to get away to sea, or St. George's bay, as the gale will probably become N.W.

In fresh S.W. winds as rollers are liable to set in from N.W.; the further out ships anchor, as in 14 or 15 fathoms, the less they feel them.

No. 68.—MEDITERRANEAN—GIBRALTAR STRAIT.—*Pearl Rock.*—The wreck of a large iron steamer lies on the Pearl Rock, off Cabrita Point, in Gibraltar strait, lies awash at high water. In breaking up, the engines, etc., will probably remain for some time, with very little water over them; caution is therefore necessary when approaching the rock. A patch, with only 8 feet water, has been discovered a little inside the shoalest part marked on the Chart.

A good clearing mark for passing East of the rock is the lighthouse on Verte island, seen clear of Carnero Point.

ITALY—WEST COAST.—*Alternating Light on Pianosa Island.*—The Italian Government has given Notice, that from the 15th day of July, 1868, a light will be exhibited from the tower of the penal establishment on the East side of Pianosa Island, Tuscan archipelago.

The light shows a *white* and *red* face alternately for a minute's duration each. It is elevated 140 feet above the level of the sea, and in clear weather should be seen from a distance of 17 miles.

The illuminating apparatus is dioptric or by lenses, of the fourth order.

Position, as given, latitude 42° 35′ 6″ N., longitude 10° 5′ 45″ East from Greenwich.

IONIAN ISLANDS.—*Buoys and Light, Corfu and Paxo Islands.*—Also, that the buoys which were placed on the Bianca shoal, South end of Corfu Island, and on the Madonna shoal, East of Paxo Island, do not exist; and that in consequence of defective illumination, the light on Corfu Island is scarcely visible.

Caution is therefore necessary when navigating in the Ionian waters.

No. 69.—RED SEA—WEST COAST.—*Removal of Temporary Lights and Buoys.*—With reference to Notice to Mariners No. 16, dated February, 1868, respecting the establishment of temporary lights and buoys for the purpose of facilitating the navigation between Perim island and Ansley bay, West Coast of the Red Sea—

Notice is hereby given, that in consequence of the Abyssinian expedition having terminated, the lights and buoys described in that Notice have been removed.

Pacific Hydrography.

Notes from H.M. Ships on the following Islands of the South Pacific Ocean.

Niua-fu, or Good Hope Island.

This is a volcanic island, nearly circular, 3½ miles from north to south, and 3 miles from east to west; it is about 500 to 600 feet high, and well wooded to the summit. The centre of the island, an old crater, is filled with brackish water, in which are hot springs, and traces of volcanic action are everywhere to be seen. A severe eruption took place in 1853, when a village was destroyed and many lives were lost; and on the 12th April, 1867, another eruption occurred, but without loss of life: this last outbreak was on the south end of the island, and at the time of the visit of the *Brisk* a little smoke was still observable ascending from the mounds of cinders and ashes which had destroyed the luxuriant vegetation.

The cocoa-nuts grown on this island are remarkably fine, equalling those of Rotumah.

The inhabitants, 1,200 in number, are Tongese Christians; the church and the teacher's house are remarkably neat and well built.

There is only one spot where a vessel can anchor; this is on the West side, where a depth of 15 fathoms may be found at a distance of about a cable from the shore, with a sandy bottom; but it is too close in to be a safe berth.

Black lava rocks line the shores all round the island, and landing is at times difficult and hazardous.

The North-west extreme, where the principal village is situated, lies in latitude 15° 34′ S., longitude 175° 40′ 40″ W.; no bottom could be obtained with 130 fathoms of line, a mile off this point.—*H.M.S. Brisk*, Captain C. W. Hope.

All Bearings are Magnetic.

Fiji Islands.

Mbau Roads.—In proceeding to this roadstead, supposing a vessel to have entered through the Moturiki channel, after clearing the shoal patches and the reef of Leleuvia island, a S. by W. course will lead towards Mbau island, which will not be made out until approaching nearer; for some miles this course will lead clear of the shoals, but a vigilant look out must be kept from aloft, and on approaching Mbau, the coral patches and sandbanks will be seen through the clear water.

Caution must be observed in rounding the north-western extreme of the reef off Leleuvia island, as a shoal patch lies off it.

Low water is the best time for navigating these waters as the shoals are then more distinctly seen. The position of the sun in the sky must also be considered.

This extensive sheet of water is surrounded by a network of coral patches, some of which are partially dry at low water, while others never uncover, and all may be crossed by a boat at high tide. The outer sea reef, which is here 6 or 7 miles distant, most effectually breaks the ocean swell, while the numerous inner reefs prevent any sea getting up.

From Mbau roads it is about 12 or 14 miles to the town of Rewa; it is

necessary to take high water to cross the many reef patches intervening between the roads and the mouth of the river.

The position of the flagstaff on Mbau island is in latitude 17° 57′ S., longitude 178° 37′ W.

Tavukie Bay (Kadavu island) is an anchorage not to be recommended; the bay is full of coral patches of various depths; on some, the sea breaks always, on others more rarely, and on some it never breaks: the most dangerous of these, a detached rock, called the *John Wesley*, lies about a third of a mile off the eastern point of the bay, and on which the sea only breaks at low water when there is a swell. About a mile further to the westward, off the centre of the bay, is a detached reef always showing, and the passage in to the anchorage lies between the two, but a tolerably wide berth must be given to the reef, as there are other patches to the eastward of it which do not show distinctly; upon one of these with 10 feet water on it, the *Brisk* struck while steaming slowly in to the anchorage.

In the bay the bottom is very rocky and uneven, and accidents to the ground tackle frequently occur, but a sandy spot is said to exist.

The bay is also subject to sudden gusts of wind from the high land.

Galoa bay is reported to be a much superior anchorage to Tavukie.—*H.M.S. Brisk.*

Conway Reef.

The *Brisk* passed close to this reef in November, 1867; none of the cocoa-nut trees planted there by Captain Denham in 1856 were remaining, and there was no sign of vegetation, the sand bank being white and bare. An upright piece of wood, like the stave of a cask (possibly a portion of the fence put up by Captain Denham round the plantation), and the two anchors mentioned by him as lying on the weather side of the reef, were plainly visible.—*H.M S. Brisk.*

Variation 10° *Easterly in* 1868.

Malden Island.

Malden island is a low coral island about 9 miles long and 7 broad, and in no place more than 30 feet above the level of the sea; a few shrubs and marine plants grow on the island, but no fresh water is to be found; repeated attempts having been made to obtain it by sinking wells. There are several salt lagoons (one of large size), the waters of which ebb and flow with the ocean tide; indications of former inhabitants exist.

The island is steep-to, with but an indifferent anchorage on the lee or western side; it is worked for its guano by a Melbourne company, who have a boat pier run out under shears, from which the cargo boats are loaded: several sets of moorings are laid down for the use of this company's vessels.

At the time the *Falcon* was at the island a strong current was running to the westward, ships therefore when navigating in this vicinity should be careful.

From Navigating Lieutenant Thomas's observations, the anchorage is in latitude 4° 5′ S., longitude 154° 56′ W.

Starbuck Island.

This island appears to be smaller in extent than Malden island, but similar in character; no anchorage was found, and great difficulty was experienced in landing. The guano establishment was deserted, but

everything left in working order. A proclamation by Commander Swinburne of *H.M.S. Mutine*, dated December, 1866, taking possession of the island in the name of Her Majesty, was found. The position of the N.W. part of the island is in about latitude 5° 36½′ S., longitude 155° 51′ W.

Penrhyn Island.

Penrhyn island consists of numerous low islets, connected by reefs, surrounding a lagoon, the whole of an oval form, about 9 miles long and 5 miles broad. All the islets are covered with cocoa-nut palms, many however, without heads, an indication that a hurricane had swept over the island.

On the N.E. side, near the northern extreme, is a clear opening in to the lagoon, in which the least water found was 2 fathoms.

Liderous Island.

The *Falcon* passed over the position assigned to this island, viz., latitude 11° 2′ S., longitude 162° 0′ W., without sighting it.—*H.M.S. Falcon*, 1867.

Humphrey Island.

Humphrey's island (Monahiki) is a coral lagoon island of triangular shape, with its apex to the north; it is 6 miles in length by 5 at its greatest width, low, and densely covered with cocoa-nut trees which reach to a height of from 60 to 70 feet, and render the island visible at 12 miles from a vessel's deck.

The population amounts to between 400 and 500, their food consists of the fruit of cocoa-nut tree and fish caught in the lagoon, the former are very productive and great pains are taken to renew them by replanting; each family has a certain number of trees allotted to them, and even the lagoon is partitioned out in the same way for fishing.

They are an extremely well-conducted people, and have two native teachers among them, sent from the English mission at Raratonga; many of the natives speak and write the English language.

The village is on the west side of the island, and is very clean, neat, and well built, paved with coral; there is also a large church and school-house. The island is governed by a chief who styles himself king, and holds some sway over the neighbouring island of Rierson.

There is no entrance into the lagoon, even for boats, but there is fair landing with a whale boat on the north-west side of the island, close to the village, except during the months January to April, when westerly winds and unsettled weather prevail.

There is no safe anchorage at any time.

The north point of the island is in latitude 10° 20′ 30″ S., longitude 161° 01′ 12″ W.—*H.M.S. Hecate*, 1863.

Rierson Island.

Rierson island (Rokahanga) lies about 20 miles to the N.N.W. of Humphrey island, and is similar to it except that it is about half the size; it has also its village, church, and school on the south-western side, with native teachers, and nothing can exceed the order and correct behaviour of the natives, who number about 340.

Landing is not very good here but can generally be effected in a

whale boat, with the assistance of the natives, who wade out into the surf and guide the boat through a narrow and winding fissure in the reef, about one-third of a mile to the northward of the village.

The position of the church is latitude 10° 02′ S., longitude 161° 05′ 30″ W.

The missionary vessel of the London Mission pays periodical vists to these two, as well as to many of the islands, where they have teachers established.—*H.M.S. Hecate.*

Flint Island.

Flint island was searched for on its reported parallel, viz., 10° 28′ S., from 20 miles east of its meridian, as laid down in the Admiralty Charts, viz., 162° 14′ W., to 45 miles westward of it without any sign of land, and as there is other strong testimony to its non-existence it has been removed from the chart.—*H.M.S. Hecate.*

Dartmouth, July 15th.

Dear Sir,—As the accompanying little Rule may interest some of your readers, I send it for you to make such use of as you may think proper. Yours, very faithfully,

A. C. Johnson.

Short Double Altitude.

In the following method, the altitudes are supposed to be taken at about the same time before, and after 6h. p.m., or 6h. a.m.

Example.

Altitudes.		Times. h. m. s.		
18°		5 42 9		
12		6 20 33		
Sum. 30		2 | 38 24		
Diff. 6		19 12	.. Cosec.	11·07739
½ Sum. 15	.. ..		.. Cos.	9·98494
½ Diff. 3	.. ..		.. Sine.	8·71880
Dec. 20° N.	.. .. ..		.. Sec.	10·02701
			Cos. lat.	9·80814
			Latitude	50° N.

The above rule will not be available in the *Tropics*, nor when the latitude and declination are of *contrary names;* but it may be found useful in other parts, and it is worthy of notice on account of its extreme brevity, being, probably, the shortest method of the kind extant. A. C. J.

Royal National Life-boat Institution.

On the 2nd of July a meeting of this institution was held at its house, John Street, Adelphi. Reports were read from the inspector and his assistant, on their recent visits to life-boat stations on the Scotch and Irish coasts. Captain Ward reported that with one exception he found the life-boats on the Scotch coasts in a state of thorough efficiency. With regard to the seven safety fishing-boats which the society had built as model boats, the inspector had recently seen three of them on the Scotch coast and found the experiment most successful. The fishermen at those places were alive to the superiority of these boats, and were already building boats after them. Thus a permanent improvement in this kind of boat will be established. Captain Robertson reported that without exception, he found the life-boats on the Irish coast, all of which belong to the institution, in admirable order.

These reports gave great satisfaction, the system of the society, even in the remotest districts, having been thoroughly observed. The crews of the life-boats were satisfied with their qualities, and kept them in perfect order, and in readiness for instantaneous service.

Some remarkable cases of the restoration of the apparently drowned were brought under the notice of the institution. In one instance, a child named Owen Jones was saved at Holyhead, apparently dead, and it was an hour and a half before he gave signs of life. He was treated for two hours in accordance with the instructions of the institution, based on the systems of Drs. Marshall Hall and Sylvester, under the directions of William Rowlands, the veteran coxswain of the Holyhead life-boat, who had made himself perfectly familiar with the method of restoring the apparently drowned. It is strongly urged that these instructions should not only be explained by medical men, clergymen, and others to all classes of the community, and posted in conspicuous places in localities adjoining the sea, lakes, and rivers, but that every opportunity should also be taken by masters of schools, and the heads of other large establishments, of impressing them on the minds of all who are subject to their influence and control. It may be added, that copies of these instructions can be had on application at the institution in London.

Sir W. Clayton, Bart., had, in addition to his own annual subscription of £5, kindly collected for the institution £1 3s. in pence, and £9 10s. 6d. in various other sums; and the pupils of Henry Vere Pearson, Esq., of Southgate Villas, after reading Ballantyne's book on the life-boat, had forwarded the society a contribution of £1 12s. 6d. It was stated that the late Joseph Hudson, Esq., of Barrow-upon-Soar, Leicester, had left the society a legacy of £100. The late Mr. F. Hoar, of Rochester, had also bequeathed it £10. Robert Ker, Esq., of Auchinraith, N.B., and the members of his family, were about to present a life-boat to the institution, along with a sum of money to endow it, in memory of Mr. Ker's eldest son, who was unhappily drowned on the coast of Argyllshire.

Payments amounting to upwards of £1300 were ordered to be made on various life-boat establishments.

THE ROYAL NAVY IN COMMISSION.

The following list does not include all the Store Ships, Despatch, and Surveying Vessels.

Name of Vessel.	No. of Guns.	Horse Power.	Commander's Name.	Station.
Aboukir.....	86	400	Com. M. E. Smithett and Commodore A. Phillimore	Jamaica .....
Achilles	26	1250	Cpt. E. W. Vansittart, C.B.....	Channel sqd.
Adventure...	2	400	Capt. F. G. Suttie(act.)	China
Algerine ...	1	80	Lieut. C. E. Domville	China
Antelope ...	3	260	Lieut. J. Buchanan...	Mediterran.
Arethusa ...	35	500	Capt. R. Coote.....	Mediterran.
Argus.....	6	300	Com. F. W. Hallowes	China
Asia	...	...	Capt. W. C. Chamberlain Rear-Admi G. G. Wellesley, C.B.	Portsmouth
Avon	2	120	Com. G. D. Fitzroy...	China
Barracouta ..	6	300	Com. G. D. Bevan ...	N. Amer. and W. Indies
Basilisk	6	400	Cpt. W. N. W. Hewett. V.C.....	China(or. h.)
Beacon	2	120	Com. E. T. Parsons...	S C. America
Bellerophon.	14	1000	Capt. R. J. J. G. MacDonald, Rear-Admi. Alfred P. Ryder ...	Channel sqd.
Blanche	6	350	Cpt J. E. Montgomerie	Australia
Boscawen ...	20	...	Com. R. O. Leach ...	Portland
Brilliant.....	16	...	,, T. T. Bullock...	Dundee
Brisk	16	250	Capt. C. W. Hope ...	Australia (ord hom.)
Bristol	31	600	Capt. F. W. Wilson...	Part. service
Britannia ...	8	...	Capt. J. Corbett	Dartmouth
Buzzard.....	6	300	Stff. Cm. J. G. H. Thain	Part. service
Caledonia ...	30	1000	Capt. A. H. Gardner Vice-Admiral Lord C. Paget, C.B.	Mediterran.
Cambridge...	...	...	Capt. the Hon. F. A. C. Foley.....	Devonport
Cameleon ...	17	200	Com. W. H. Annesley	Pacific
Canopus.....	8	...	Capt G. J. Napier ...	Devonport
Caradoc	2	350	Lt.-Cm. H. H. A'Court	Mediterran.
Castor.....	22	...	Com. C. G. Nelson...	Shields
Challenger...	18	400	Com. C. J. Brownrigg, Commod. R. Lambert, C.B.	Australia
Chanticleer..	17	200	Cm. W. W. S. Bridges	Pacific
Charybdis ...	17	400	Capt. A. Mc. L. Lyons	Pacific
Clio	22	400	Capt. N. E. B. Turnou	Pacific(or.h.)
Constance ...	35	500	Capt. H. T. Burgoyne, V.C.	N. Amer. and W. Indies
Cordelia.....	11	150	Com. C. Parry	N. Amer. and W. Indies (ord. hom.)
Cormorant...	4	200	,, G. D. Broad ...	China
Cruiser	5	60	,, M. Singer	Mediterran.
Cumberland.	24	...	Capt. the Hon. A. A. Cochrane, C.B.	Sheerness
Dædalus ...	16	...	Com. I. T. M. Nicholl.	Bristol
Danä	...	350	Cpt. Sir M. MacGregor Bart.	W. C. Africa
Daphne	4	300	Com. G. L. Sullivan...	East Indies
Dart	5	80	Com. M. Lowther ...	N. Amer. and W. Indies
Dasher	2	100	,, J. H. Bushnell	Channel Isls.
Dauntless ...	31	580	Capt. E. P. B. Von Donop	The Humber
Defence	18	600	Capt. C. M. May.....	Channel sqd.
Donegal	81	800	Capt. E. W. Turnour	Birkenhead
Doris	24	800	Capt. H. C. Glyn.....	N. Amer. and W. Indies
Dromedary..	2	100	Staff-Cm. J. Kiddle..	W. C. Africa
Dryad	4	300	Cm. T. H. B. Fellowes.	East Indies
Duke of Wellington ...	49	700	Capt. T. Cochran.....	Portsmouth
Duncan	81	800	Capt. C. Fellowes ...	N. Britain
Durham(late Active) ...	20	...	Com. G. G. Duff.....	Sunderland
Dwarf.....	2	120	Com. C. F. Walker...	China
Eagle	16	...	Com. E. C. Symonds.	Liverpool
Eclipse	6	350	Capt. L. J. Moore ...	Part. service
Egmont	4	...	Cpt. H. F. W. Ingram	R. de Janeiro
Endymion ...	21	500	Capt. C. Wake.....	Mediterran.
Enterprise ...	4	160	Com. G. S. Bosanquet	Mediterran.
Excellent ...	...	...	Capt. A. W. A. Hood	Portsmouth
Falcon	17	100	Com. H. L. Perceval	Austra (o.h.)
Favourite ...	10	400	Capt. J. D. McCrea...	N. Amer. and W. Indies
Fisgard	42	...	Com. J. M. Jackson (bearing brd. pendt. of Commodore W. Edmonstone, C.B.)	Woolwich
Flora	40	...	Capt. A. Wilmshurst	Ascension
Formidable..	26	...	Capt. D. Mc L. McKenzie, Vice-Adm. Sir B. W. Walker, K.C.B.....	Sheerness
Fox	2	200	Staff-Cm. R. B. Batt.	Part. service
Frederick William ...	74	500	Cpt J. J. Kennedy, C.B.	The Shannon
Galatea	26	800	Capt. H. R. H. the Duke of Edinburgh K.G.....	Portsmouth Par. service
Gannet	3	150	Com. W. Chimmo ...	N. Amer. and W. In.(o.h.)
Ganges	20	...	Com. J. E. M. Wilson	Falmouth
Gnat	2	120	Com. C. B. Theobald	China
Greyhound..	5	200	Capt. C. Stirling	S. E. C. Amer.
Hector	20	800	Cpt. A. F. R. De Horsey	Southam. W.
Helicon	...	250	Com. E. Field	Channel sqd.
Hibernia ...	104	...	Com. W. L. Partridge Rear-Admiral E. G. Fanshawe	Malta
Highflyer ...	21	250	Capt. T. M. S. Pasley	E. In. (o. h.)
Himalaya ...	2	700	Capt. S. B. Piers.....	Part. service
Hydra	1	220	Capt. P. F. Shortland	E. In. (o. h.)
Icarus.....	8	150	Com. Lord T. C. M. D. Scott.....	China
Implacable..	24	...	Com. P. W. Pellew...	Devonport
Impregnable	78	...	Capt. W. G. Jones...	Devonport
Indus	...	...	,, G. O. Willes, C.B. Rr.-Ad. the Hon. J. R. Drummond, C.B.	Devonport
Industry ...	...	80	Stf.-Com. C. J. Polkinghorne	Part. service
Investigator.	2	34	Lt.-Cm. J. H. O'Brien	W. C. Africa
Irresistable .	60	400	Com. A. G. R. Rowe	Bermuda
Jackal	1	150	Lt.-Com. A. E. Dupuis	W. C. Scotld.
Jaseur.....	5	80	Com. C. F. Hotham...	W. C. Africa
Jason	17	400	Capt. C. N. Aynesley	N. Amer. and W. Indies
Juno	6	400	Capt. W. A. B. Pearce	Part. service

Name of Vessel.	No. of Guns.	Horse Power.	Commander's Name.	Station.	Name of Vessel.	No. of Guns.	Horse Power.	Commander's Name.	Station.
Lee	5	80	Com. C.W. Andrew...	W. C. Africa	Revenge ...	73	800	Cpt. W. J. S. Pullen	Pembroke D
Leven	2	80	Lt.-Cm.O.S.Cameron	China	Rinaldo	7	200	Com. W. K. Bush ...	China
Liffey	31	600	Capt. J. O Johnson.	Part. service	Rodney	78	500	Capt.A.C.P Heneage Vice-Adml. Sir H. Keppel, K.C.B.	China
Lion	60	400	Capt.J M.Hayes,C.B.	Greenock					
Lizard	1	150	Lieut S. G. Price ...	Sheerness	Rosario	11	150	Com. G. Palmer	Australia
LordClyde...	23	1000	Capt. R. Dew, C B....	Mediterran.	Royal Adelaide	26	...	Capt. G. W. Peedy. C.B., Admiral Sir W. F. Martin, Brt., K.C.B.	Devonport
LordWarden	20	1000	Capt. W. R. Rolland	Ditto					
Malacca	13	200	Capt. R. B. Oldfield.	Pacific					
Manilla	...	70	Nv-Lt.F.A.Johnston	China					
Medusa	...	312	Stf-Cm.G.B.F.Swain	Part. service					
Meeanee	...	...	Com. H. M. Miller...	Hong-Kong					
Megæra	4	350	Staff-Com. J. Loane..	Part. service	Royal Alfred	18	800	Capt. the Hon. W. C. Carpenter, Vice-Ad. Sir G. R. Mundy, K.C.B.	N.Amer.and W. India
Mersey	36	1000	Capt. R. D. White ... Rr.-Adml. C. M.H. Buckle, C.B.	Queenstown					
Minotaur	34	1350	Cpt.J.G.Goodenough Rr.-Adml. F. Warden, C.B.	Channel sqd.	RoyalGeorge	72	400	Capt. R. Jenkins,C.B.	Kingstown
					Royalist	11	150	Com. L. F. Jones ...	N.Amer.and W. Indies
Mutine	17	200	CmH.M.C.Alexander	Pacific					
Mullett	5	80	Com. E. Kelly	N.Amer.and W. Indies	Royal Oak	24	800	Capt.H.S.Hilyar,C.B.	Channel sqd.
					St. George	72	500	Capt. M. S. Nolleth..	Portland
Myrmidon	4	200	Com. H.R.Johnstone	W. C. Africa	St. Vincent	26	...	Com. R. Carter	Portsmouth
Nankin	50	...	Capt. R. Hall	Pembroke ...	Salamis	...	250	Com.E.P.Pusey(act.)	China
Narcissus	35	400	Capt. J. C. Wilson Rr.-Adml. G.Ramsay, C.B.	S.E.C.Amer.	Satellite	17	400	Capt. J. Edye	Pacific
					Scout	21	400	Capt. J. A. P. Price..	Pacific(o. h.)
					Sealark	8	...	Lieut.F.G.D.Bedford	Devonport
Nassau	5	150	Capt.R.C.Mayne,C.B.	S.ofMagellan	Seringapatam	...	...	Cmd.G. G. Randolph	C.of G. Hope
Nelson	72	500	Com.C.B.Payne(act.)	Melbourne					
Nereus	6	...	Staff-Cm. J. P. Dillon	Valparaiso	Serpent	4	200	Com. C J. Bullock..	China (o. h.)
Niger	13	350	Capt. J. M. Bruce ...	N.Amer.and W. Indies	Sharpshooter	6	160	Lieut. B.S.Hamilton	S.E.C.Amer. (o. h.)
Niobe	4	300	Com. T.K.Mackenzie	N.Amer.and W. Indies	Simoom	4	400	Cpt. T B.Lethbridge	Part. service
					Slaney	1	80	Lieut.W.F. L. Elwyn	China
Nymphe	4	300	Com. T. Barnardiston	East Indies	Sparrowhawk	4	200	Com. E. A. Porcher	Pacific
Oberon	3	260	Lieut.-Com. J. Shortt	S.E.C.Amer	Speedwell	5	80	Com J. P. J. Parry..	W. C. Africa
Ocean	24	1000	Capt.C.S. S.Stanhope	China	Sphinx	6	500	Capt. J. E. Parish ...	N.Amer.and W. Indies
Octavia	35	560	Com. W. H.Maxwell Commodore L. G. Heath, C.B.	East Indies	Spiteful	6	280	Com. B. L. Lefroy ...	East Indies
Pallas	6	600	Cpt. E. H.G.Lambert	Channel sqd.					
Pandora	5	80	Com. W. Spratt	W. C. Africa	Star	4	200	Cm.W.S.DeKantzow	East Indies
Pearl	21	400	Capt. J. F. Ross	China	Sylvia	5	150	Com. E. W. Brooker.	China Seas
Pembroke	25	200	Capt. Hon. J. W. S. Spencer, Rr.-Adml. John W. Tarleton, C.B.	Harwich	Tamar	2	500	Cp. F.W.Sullivan,C.B	Part. service
					Terrible	19	800	Capt. T. P. Coode ...	Portsmouth
					Terror	16	200	Capt. J. F. B. Wainwright	Bermuda
Penelope	19	600	Capt. F. Marten	Channel sqd.	Topaze	31	600	Cmd. R. A. Powell,C.B	Pacific
Penguin	5	80	Lt.-Com. J. J. Martin	E.Ind. (o.h.)	Trafalgar	60	500	Capt. E. K. Barnard.	LoughSwilly
Perseus	15	200	Com. C. E. Stevens...	China	Trincomalee	16	...	Com. E. T. Nott	Hartlepool
Peterel	3	150	Com. Hon. E. G. L. Cochrane	C.of G. Hope	Urgent	4	400	Capt.S.H. Henderson	Part. service
					Vestal	4	300	Com. J. E. Hunter...	W. C. Africa
Philomel	3	160	Com. J. H. Coxon ...	N.Amer.and W. Indies	Victoria and Albert	...	600	Capt. His Serene Highness the Prince of Leiningen, C.C.B	Portsmouth
Phœbe	35	600	Capt.J.Bythesea,v.c.	N.Amer.and W. Indies	Victory	12	...	Capt.F.B.P.Seymour C.B.Admiral Sir T. Pasley, Bart.	Portsmouth
Pioneer	1	34	Lieut. H. S. Sandys..	W. C. Africa					
Plover	3	160	Com. J. A. Poland ...	W. C. Africa					
President	16	...	Com. H. W. Comber	City Canal	Vigilant	4	200	Com. R. A. O. Brown	E. Indies
Princess Charlotte	12	...	Commod. O. J. Jones	Hong Kong	Viper	2	160	Com. H. E. Crozier...	Portsmouth
					Virago	6	220	Com. H. M. Bingham	Australia
Prince Consort	31	1000	Capt. W. Armitage...	Channel sqd.	Vixen	2	160	Cm. L. H. Versturme	Devonport
Pylades	17	350	Cpt C.W.Buckley,v c	Pacific	Warrior	32	1250	Capt. H. Boys	Channel sqd.
Racoon	22	400	Capt. R. Purvis	C.of G. Hope	Waterwitch	...	...	Com. P. R. Sharpe...	Devonport
Rapid	11	150	Cm. Hon. F. L.Wood	Mediterran.	Winchester	12	...	Com. G. M. Balfour	Aberdeen
Rattler	17	200	Com. J. T. Swann ...	China	Wyvern	4	350	Capt. G. A.C.Brooker	Part. service
Rattlesnake	19	400	Com. J. G. Meade Commod. W. M. Dowle, C.B.	W. C. Africa	Zealous	20	800	Capt. R. Dawkins Rr.-Adml. Hon. G. F. Hastings, C.B.	Pacific
Reindeer	7	200	Com. E. Nares	Pacific	Zebra	7	200	Com.H.A.Trollope...	China

Positions of Islands in the North Pacific.

Harbour-Master's Office, Honolulu,
April 27th, 1868.

Having acquired some more information from various sources of the positions of islands, rocks, and shoals in the North Pacific, principally between this port and China, Japan, etc. (my authority I have mentioned opposite each island), I now send you my list according to promise. I have likewise sent you a list of islands, rocks, and shoals, marked on the various charts as doubtful, which have been looked for or sailed over by many vessels, whalers and merchantmen, but have not been seen. I need not tell you how many log books I have overhauled, as you know yourself—a great many.

I may remark that strong currents or tide-rips are frequent, especially from 10° north, to 10° south in this ocean, making a noise like breakers, and at times looking like broken water for a considerable distance.

List of Positions,

Which I have obtained from many sources, of a very dangerous part in the North Pacific, directly in the track of steam vessels bound to Japan and north coast of China, proceeding from this port.

Names.	Lat. North.	Long. West.	Authority.
Bird Island, 534 ft. high	23° 06	161° 57	
Neckar Island, 280 ft. high	23 35	164 39	Lieut. Brooke, U.S.N.
French Frigate Shoals—			
S.E. extremity	23 44	166 04	Lieut. Brooke, U.S.N.
N.W. „	23 52	166 22	
S.W. „	23 42	166 22	
Islet on the reef	23 46	166 17	
Gardener Island and Rocks, 170 ft. high	25 01	167 59	Lieut. Brooke, U.S.N.
Maro Reef (breakers extending six miles N.N.W. and S.S.E.)	25 31	170 37½	Lieut. Brooke, U.S.N.
Laysan Island, centre	25 48	171 42	Lieut. Brooke, U.S.N.
Bank, soundings 15, 17, 20 and 40 fathoms	25 46	173 20	Lieut. Brooke, U.S.N.
Lisiansky	26 03	173 42	Capt. Paty and others.
Brookes, Middleton, or Massachusetts Island	28 13	177 23	Capt. Brooks, *Gambia*, P.M. Company's depôt, 1867.
Bunker's or Philadelphia Island	28 00	173 30	Doubtful, not yet certain.
Pearl and Hermes Reef, N.E. point, N. and S. 50 miles, E. and W. 60 miles	27 56	175 46	Various authorities, Capt. Brooks, *Gambia*, principally*.

* By the late observations of the U.S. steamer *Lackawanna*, just communicated, this reef is forty-two miles in circumference. Latitude and longitude as above.—Ed.

Names.	Lat. North.		Long. West.		Authority.
Ocean, Cure, Staver's Island	28	25	178	30	Various authorities (mean).
Delaware Reef or Shoal	27	30	174	20	Very doubtful.
Johnston, Smith, or Cornwallis Island	16	45	169	30	Lieut. Brooke, U.S.N., by various others (mean).
	16	45	169	46	
Howland's Island	00	48	176	33	Capt. Chisholm.
Baker's Island	00	13	176	22	Mr. C. A. Williams.

Two brothers (islands)—very doubtful—I may safely say do not exist. Lieut. Brooke, *Fennimore Cooper;* Capt. Brooks, *Gambia;* Capt. Paty, *Manuokawai.*

To be continued from 180°.

POSITIONS COULD NOT BE FOUND.

Names.	Lat. N.		Long. W.		Names.	Lat. N.		Long. E.	
Parappa Rock ...	21°	30	161°	18	*Reef.....	23	45	164	00
Malloon's Island	19	20	165	21	*Camira Island ...	21	32	160	00
Wilson Island ...	19	22	166	50	*Shoal	18	30	173	45
Shoal	18	28	170	30	*St. Bartholomew Island	14	40	174	25
Reef	16	38	160	53	Decker Island ...	23	22	162	50
Shoal	14	50	170	32	Deseirta	20	10	165	20
Shoal	13	30	170	30	Deseirta	23	12	160	50
Island	13	04	168	22	Lamira Island ...	10	10	164	09
Island	11	28	163	53	Island	20	28	166	54
Paltron Island ...	10	18	165	25	Island	18	57	163	30
San Pedro Island	11	10	179	02	Wake Reel	17	50	173	45
Island	8	20	170	00	Island	16	02	171	38
Davis Island	6	38	170	05	Island	17	10	176	52
Island	6	33	166	03	Island	16	02	176	26
Barbera Island ...	3	42	173	06	Tarquin Island ...	17	00	160	01
Reef.....	3	55	174	32	Reef.....	17	15	159	17
Malcin Island ...	2	57	172	45					
Mathew Island ...	2	07	173	26					
*Reef	10	04	179	21					
*Barber Island ...	9	00	178	00					
*Knox Island	5	58	172	00					

POSITIONS OF ISLANDS, ROCKS, AND SHOALS—SOME OF THEM VERY IMPERFECTLY ASCERTAINED—FROM 180° GOING WESTWARD.

The Marshall, Gilbert, and Caroline groups, and the Mariana or Ladrone Islands are not taken in yet—will form another list.

Omitted in above—Krusenstern Rock, lat. 22° 15′ North, long. 175° 37′ West.—Authority, Admiral Krusenstern.

* I have not yet got sufficient data to determine positively on the above. In some log books I find "appearance of land" while in their vicinity—especially while near the position assigned to Bartholomew Island.

Names.	Lat. North.	Long. East.	Authority.
Merrel Island or Bank	29° 57	174° 31	(Doubtful) Raper's Epit.
Byer's Island, Patrocinio	28 09	175 48	„ Raper
Rico-de-Oro	29 51	157 04	„ Raper
Fatsizi's Island, middle	33 06	140 00	Raper
South Island	32 30	140 03	Krusenstern and Raper
Ponafidin Island or Rock	30 30	140 06	Lieut. Ponafidin.
Bayounaise Island or Rock	32 01	140 00	Fr. frigate *Bayounaise*.
Smith Island or Rock	31 18	139 50	H.M.S. *Tribune*.
Sail Rock or Lot's Wife	29 47	140 22	U.S.S. *Macedonia*.
Malabriga Islands	27 20	145 25	Raper (doubtful position).
Grampus Islands	25 10	146 40	Raper do. do.
Volcano Islands—			
Sulphur Island	24 48	141 20	Raper.
Reef Island	24 48	141 24	*Napoleon 3d*, whaler.
San Alesandro Island	25 14	141 18	Raper.
Dionisio Island	24 42	141 28	Raper.
Bonin Islands, extending N. and S. 42 miles—			
Parry's Group, N. rock	27 45	142 07	Raper.
Kater Island, N. rock	27 31	142 12	Raper.
Peel Island, S.W. Islet	27 02	142 10	Raper.
Port Lloyd, Peel Island	27 06	142 11	Raper.
Bailey Islands, S. Islet	28 30	142 13	Raper.
Rosario Island	27 16	140 50	Raper. } Not well ascertained.
Kendrick Island	24 35	134 00	Raper. }
Rosa Island	24 28	130 40	Raper. }
Berodino Islands, N. one	26 02	131 15	Raper.
Parece Vella, Sail Rock	20 30	136 06	Captain Douglass.
Barras Rock	21 42	140 55	Captain Barras, *Mary Ann*.
Lindsay Rock	19 20	141 20	Captain Lindsay, *Amelia*.

Cornwallis, Smith, Sybilla, or Gaspar Rico Reef, with Islets, south-south-east and north-north-west 20 miles. Northernmost clump of rocks 14° 41′ north, 168° 50′ east.—Lieut. Brooke, U. S. N., Capt. T. Long, and others.

Halcyon or Wake's Island or Reef, on which the *Labelle* was wrecked in 1866—entrance to lagoon boat passage, 19° 19′ north, 166° 30′ east. This island or reef is placed in lat. 19° 11′ north by the U. S. Exploring Expedition, but by Captains Wood, Cargill, and English, who have visited the wreck, as above—19° 19′ north and 166° 30′ east.

Marcus Island is marked doubtful on most charts, but Capt. Gelett, in the *Morning Star*, in 1864, passed near an island, in latitude 24° 04′ north, and longitude 154° 02′ east.

Marshall or Jardine Islands (two small), 21° 40′ north, 151° 35′ east. Some whalemen affirm that they have lunded on the rocks; others assert that they have sailed over this position without seeing anything.—Authority, ship *Scarborough*, 1788.

Names.	Lat. North.	Long. East.	Authority.
Assumption Island, 2000 ft. high...	19° 41	145° 27	Lieut. Raper.
Uraccas Rocks.....	20 10	145 25	Lieut. Raper.
Farallon Island—Authority, the Spanish corvette *Narvaez* ...	20 30	145 12	Lieut. Raper.
Guy Rock.....	20 30	145 30	Lieut. Raper.
Grigan Island	18 48	145 40	Lieut. Raper.
Pagon Island	18 15	145 48	Lieut. Raper.

The three last positions are not well ascertained,

Yours, etc., DANIEL SMITH.

THE ADMIRALTY SOUTH POLAR CHART.

31, Poultry, London.
26th June, 1868.

SIR,—I have read, from time to time in the public prints, letters from commanders of merchant ships, giving accounts of icebergs encountered by them in making their voyages in high southern latitudes between Australia and Cape Horn, involving in many cases anxiety and risk, as well as delay. Surely nautical men cannot generally be aware that the Admiralty published in 1866 a complete Ice Chart of the "Southern Hemisphere," which, besides accurately setting forth the limits of the ice-drift at different seasons of the year, affords much information which cannot fail to be useful to the mariner when navigating in those latitudes.

I have invariably compared the above-mentioned statements with the Ice Chart, and have always found that where ice has been met with, the Chart, if it had been on board, would have proved an unfailing monitor.

This Chart is supplied to all Her Majesty's ships, and it surely cannot be the price of it, namely, Half-a-Crown, which keeps it out of the reach of merchant commanders.

In the hope that you will insert this letter in your valuable Magazine, with the view to its circulation among seamen, and thus enabling them to guard against one of the most imminent dangers to which navigation is subject.

I remain, Sir, your obedient servant,
J. D. POTTER,
Admiralty Chart Agent.

To the Editor, Nautical Magazine.

P.S.—I enclose a copy of the Ice Chart for your inspection.

We are glad to see a copy of this Chart, the importance of which, to our Australian traders, it is impossible to overrate, and had we been

aware that any other than the South Polar Chart had been published by the Admiralty, we should certainly have contributed our assistance to make it known. We have some doubts, however, whether, with all its important attractions of information, the new Ice Chart will become so well known as it should be among those traders. There are commanders, whom the trifling sum, mentioned by our Admiralty Chart Agent, would encourage in using the old blue backed chart, to which they have long been accustomed, as quite good enough for the next voyage: and so they will go on voyage after voyage, until the ship is one day brought up by an iceberg, and runs headlong on some rocks of the Auckland Group, and then say it is because they are laid down out of their position, as an excuse to the underwriters, while all the time their place has been correct on the chart since the voyage of Sir James Ross towards the South Pole, above twenty years ago. We look on the Ice Chart of the South Polar regions as one so valuable, and so essential to the safe navigation of a ship, passing either way, round either Cape Horn or the Cape of Good Hope, that, no ship bound round those capes should be insured unless it be in her master's possession. But, as any ship now-a-days is permitted to be sent to sea *laden a foot or so deeper than her load water line*, and a paternal Government, watching over the lives of the Queen's subjects, permits such dangerously laden vessels to sail from our ports, how could it be expected that they would compel ships to be supplied with the Ice Chart? Although the cost of it may be only half-a-crown! Owners, of course, have a right to sail their ships as they please. Was a commander's certificate ever suspended by the Government because he lost his ship from not having the right chart on board? It might be because if he had it he could not use it from habits of inebriety, but who has ever heard of a sober, steady, commander's certificate being suspended from want of a chart? and yet one is just as likely to lose a ship with all hands as the other! There is much that wants rectifying yet in our mercantile shipping.

NOTES OF NOVELTIES.

AN American gentleman by name Mr. Burlingame seems to have been commissioned by the Chinese Government as their advocate in expressing their desire to break through their exclusiveness of foreigners, in fact to represent them as desirous of joining the intercourse between the nations of the world. At a reception of this gentleman in New York he thus expressed himself: The mission which he was selected to conduct, he said, was sent forth that China might have her difficulties stated, and that I happened to be at the head of it was, perhaps more an accident than any design. It was, perhaps, because I had been longer there than my colleagues, and because I was about to leave; and perhaps more than all, because I was associated with the establishment of the co-operative policy which, by the aid of abler men than

myself, was established not many years ago—and it is to sustain that policy—which has received the warm approval of all the great treaty Powers, and which is cherished by China—that we are sent forth.

I desire that the autonomy of China may be preserved. I desire that her independence may be preserved. I desire that she may have equality, that she may dispense equal privileges to all the nations. If the opposite school is to prevail, if you are to use coercion against that great people, then who are to exercise the coercion, whose force are you to use, whose views are you to establish? You see the very attempt to carry out any such tyrannical policy would involve not only China, but would involve you in bloody wars with each other. There are men who say—men of that tyrannical school—who say that China is not fit to sit at the council board of the nations, who call them barbarians, who attack them on all occasions with a bitter and unrelenting spirit. These things I utterly deny. I say, on the contrary, that that is a great, and noble people. It has all the elements of a splendid nationality. It is the most numerous people on the face of the globe; it is the most homogeneous people in the world; it has a language spoken by more human beings than any other country in the world, and it is written in the rock. It is a country where there is greater unification of thought than any other country in the world. It is a country where the maxims of great sages coming down for centuries have permeated the whole people until their knowledge is rather instinct than acquirement. The people loyal while living, their last prayer while dying is to sleep in the sacred soil of their fathers. It is the land of scholars, it is the land of schools, it is the land of books, from the simple pamphlet up to the encyclopedias of 5,000 volumes. It is a land where the privileges are equal; it is a land without caste. The power flows through the competitive system from that people into practical government; they make scholarship the test of merit.

I do not mean to say that the Chinese are perfect. They have their faults like other people; they have their pride like other people; they have their prejudices like other people. These are profound, and these must be overcome. They have their conceits like other people, and these must be done away with; but they are not to be done away with by talking to them with cannon, by telling them that their people are weak and barbarians. China finds that she must come into relations with this civilisation that is pressing up around her. Feeling that, she does not wait, but comes out to you and extends to you her hand. She tells you she is ready to take upon her ancient civilisation the graft of your civilisation. She tells you she is ready to take back her own inventions, with all their developments. She tells you that she is willing to trade with you, to buy of you, to sell to you, to help you strike off the shackles from trade. She invites your merchants, she invites your missionaries. She tells them to plant the shining cross on every hill and in every valley. Holding the great staples of the earth—tea and silk—she charges you scarcely any tariff on the exports you send out in exchange for them. She is willing to meet

the inferior questions which are now arising as to transit dues, and if you will only have patience with her and try reason on your side, she will settle this to your satisfaction.

THE "UNION"—TUBULAR PARALLELOGRAM BATTERY, ETC.—This description of vessel, designed by Mr. H. T. Richardson, Aber Hirnant, Bala, North Wales, is either adapted for sea-going purposes or coast defence, and is constructed with two metal tubes placed side by side, and which can be made of any diameter or length. The tubes terminate at each end in a single point, rising to the water line, and forming a ram. They are firmly joined together, the principle of which is shown in the sectional plans. The tubes are divided in half, the lower halves being intersected with compartments reaching to the beams that support the main deck and traverse the tubes, and which are available for engine-rooms, stores, magazines, etc. The outside and ends of the tubes are securely iron-plated. This vessel combines in the highest degree the following principles, viz.—For strength, stability in a sea-way, light draught of water, and non-requirement of ballast, that of the tubular lifeboat; for fighting, Capt. Coles's turrets, the broadside, and direct fore and aft fire; for motive power and speed Ruthven's water propulsion; and for invulnerability, Pineo's system of iron casing. As the main deck of each tube forms a separate battery when the sliding doors between them are shut, it is evident that should any part be pierced, little damage would ensue; and as the engines are below the water line, they are well protected; but, from the peculiar shape of the vessel, shots would have an inclination to glance off. Rudders are fitted between the tubes near each end, which are capable of being raised to enable either end to be the bow, and it may be remarked that the rush of water between the tubes greatly increases the power of the rudder. The steering gear is led to the wheels in the pilot-house, which surrounds the smoke-stack, the floor of which is below the level of the spar deck. Mushroom-shaped moorings near the ends are intended to be used instead of anchors, and which can be hoisted up into cells adapted for them between the tubes. The chains are carried along to their windlasses between the tubes, under the spar deck, which is on a level with the upper parts of the tubes, and hinged or removeable bulwarks are fitted to it. As this battery can go with either end first, the necessity of turning is not required; therefore she could run up any narrow creeks, and would be well adapted for forcing a way through booms or other obstructions, and being capable of using all her guns at the same time, she forms a complete parallelogram battery. Her speed would be very great, owing to her small resistance in the water, and carrying no masts to catch the wind.

THE Swedish Polar Expedition is to sail from Gottenburg early this month. The officers and gentlemen appointed to accompany the expedition include two officers of the Royal Navy of Sweden, Captain Baron von Otter, Lieutenant Palander; Professor Nordenskiöld, Dr. Lemström (who under his title of "Physiker," will take charge of

observations in physical science); next four zoologists, Drs. Malmgren, Smitt, Nyström, and Mr. Holmgren, and two botanists, Drs. Fries and Bergern. Besides these there will be a geologist and a conservator.

A NAVAL HOSPITAL FOR JAPAN.—The new army hospital to be established at Yokohama, for which provision is made in this year's estimates, will contain, about 30 officers and 120 men. By this establishment in the healthier climate of Japan the costly and unsatisfactory hospital ships at Hong Kong and Shanghae will be superseded, and it is also hoped that the present necessity for invaliding home officers and men from the squadron on that station,—a proceeding which both impairs the efficiency of the service and entails a heavy annual expenditure, will be removed. The total estimated cost of this hospital is £25,000.

[We accede to the request of the Honorary Secretary in forwarding the object of his society by inserting this address, of which we entirely approve, and only regret that law givers are unfortunately sometimes interested in checking the progress of wholesome measures. In forming such laws we should be glad to see such interested persons professionally incapacitated from having any thing to do with them].

ADDRESS TO THE ELECTORS OF ENGLAND, IRELAND, AND WALES.

A SELECT Committee of the House of Commons has, by a majority of one, declared that further restrictions on the sale of Intoxicating Drinks on Sunday are not needed. The evidence taken by that committee has proved that every restrictive measure hitherto adopted has been beneficial, and that a vast majority of the people demand that the sale of drinks should be entirely stopped on Sunday.

That the resolution of the committee should be at variance with this evidence, surprises no one who knew its constitution; that it was carried by a majority of one only, and that obtained by mere accident, is a proof of the weight of testimony which the friends of Sunday Closing were able to bring forward.

We congratulate our friends on the position we have gained in the House of Commons; instead of the subject being regarded as Utopian, it is recognized as a practical measure which statesmen will have to take in hand without delay, in the New Parliament to be chosen during the ensuing Autumn.

The country has given unmistakeable evidence of the interest it takes in this just measure for promoting virtue and morality: 4483 petitions signed by 487,697 persons have prayed the House of Commons to save the Lord's Day from the desecration caused by drunkenness; public meetings in nearly every large town of the kingdom have with an almost unanimous voice asked for the same boon. A Householders' Canvass in 180 different localities of England and Wales has shown that an overwhelming majority of the people are in favour of entirely closing public houses on Sunday. Employers of labour in all

parts of the kingdom have asked for the adoption of this measure, and the workpeople in some of the largest establishments of the country re-echo the cry. Never were the prospects of success greater; all that is required being prompt and energetic action.

A General Election is at hand. By the late Reform Act the people have been enabled to make their wishes not only felt at the hustings, but also decisive at the poll. Other great questions will no doubt be put before you during the coming struggle. Our Association pronounces no opinion upon them, but no measure of party interest, no local question should cause us to lose sight of the importance of rescuing the Sunday from the sale of Intoxicating Drink and from the vice, immorality, and irreligion which result from it.

Within the next few weeks you—Electors of England, Ireland, and Wales will have to choose the men to whom for several years will be intrusted the power of legislating for your country. It is now in your power to make the prayer of your petitions, and the spirit of your resolutions, the voice of the Legislature. Endeavour to impress upon the leading politicians in your different constituencies the importance of choosing candidates who are alive to the magnitude of this question, but if this cannot be secured let no man come before you as a candidate for parliament without your insisting on the necessity of your representatives securing for the country the blessing of a Sunday freed from temptations to drunkenness. When ever possible make those who claim your vote feel that you regard this question as a cardinal one, and that the man who will work for it, even if he should differ from you on many other points will have your vote in preference to a candidate who fails to recognise the value of social as compared to mere political improvement. Let every candidate be asked his intentions with regard to Sunday Closing when he meets the electors at the hustings, and let the country know that whatever other measures are to be carried in the New Parliament, the People are resolved to obtain the Stopping of the Sale of Intoxicating Liquors on Sunday.

By order of the Executive Committee of the Central Association for Stopping the Sale of Intoxicating Liquors on Sunday.

ROBERT WHITWORTH,
T. A. STOWELL, M.A. } Honorary Secretaries.
EDWARD WHITWELL,
REV. EDWARD MATHEWS, M.A., Travelling Secretary.
MR. EDWIN BARTON, Assistant Secretary.

Office: 43, Market Street, Manchester.

TO CORRESPONDENTS.

We continue to receive the several notices published from the *Depot des cartes, etc., de la Marine*, by the polite attention of its Director, for which we return our best acknowledgments.

We shall be always ready for "*Arion*" whenever duty or inclination claims his services.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

SEPTEMBER, 1868.

THE SUN, THE WEATHER, AND OURSELVES; AND WHAT IS SUN-STROKE.

SINCE astronomers are agreed that the light and heat of the Sun are variable quantities, we may satisfy ourselves with the conclusion that the extraordinary high temperature to which we have been lately subjected, is merely a change arising from that condition. But it involves causes, concerning which, an interesting theory has been started within the last few years. The enquiry which has produced this theory has been very justly stated to be one of singular interest, as there can be no reasonable doubt, says Sir John Herschel, "that the supply of light and heat afforded to our globe, stands in intimate connection with those processes which are taking place in the solar surface, and to which the spots (on that surface) in some way or other owe their origin." These spots are very well known, and observation shows that in point of number they have a minimum quantity every ten or eleven years. We also have it on the same authority that when the spots are attentively watched, their situation on the disc of the sun is observed to change. They advance regularly towards its western border, where they disappear, and are replaced by others which enter at the eastern border, and which pursuing their respective courses in their turn disappear at the western. Their progress is not uniform, as it would be were these spots dark bodies passing by an independent motion of their own between the earth and the sun, but is swiftest in the middle of their paths across the disc, and very slow at its borders. This is precisely what would be the case supposing them to appertain to and make a part of the visible surface of the sun's globe, and to be carried round by a uniform rotation of that globe on

its axis, so that each spot should describe a circle parallel to the sun's equator, rendered elliptic by the effect of perspective.

We are informed also in reference to these spots that from a careful assemblage and discussion of all the recorded observations which can be collected from their first telescope discovery (by Fabricius and Harriet in 1610) to the present time, that M. Wolf, of Berne, has assigned a period from minimum to minimum of about eleven years to them.

In reference to the light and heat of the sun being variable, the same authority informs us that what is extremely remarkable, and must be received as strongly corroborative, both of the general fact of periodicity and of the correctness of M. Wolf's period, is that we find recorded in history by chroniclers and annalists on several occasions, before the invention of telescopes, the appearance of spots, or groups of spots, so considerable as to have become matter of vulgar observation. For instance in the years A.D. 807, 840, 1096, and 1607, of the spots seen all were then supposed to have been the planets Venus and Mercury moving across the sun; and in several other years, in which though no spots are recorded of them, a great deficiency in the sun's light has been also remarked. Thus in the annals of the year A.D. 536, the sun is said to have suffered a great diminution of light, which continued fourteen months. From October A.D. 626 to the following June there was also a defalcation of light to the extent of one half. And in A.D. 1547 during three days the sun is said to have been so darkened, that stars were seen in the day-time. Then as to the period, supposing all these instances to have occasioned this loss of light, there are only two, 807 and 1607, which deviate so much as two years from the epochs of periodicity above mentioned.

Seeing then that these spots exercise an important part in affecting the amount of the sun's light, it naturally occurs to enquire what are these spots. The same authority again informs us that many fanciful notions have been broached concerning them, but one only seems entitled to any degree of physical probability, and this is that they are the dark, or at least comparatively dark solid body of the sun itself, laid bare to our view by those immense fluctuations in the luminous regions of its atmosphere to which it appears to be subject. Respecting the manner in which this disclosure takes place, the most probable theory is that of Sir William Herschel, who considers the luminous strata of the sun's atmosphere to be sustained far above the level of his solid body by a transparent elastic medium, carrying on its upper surface a cloudy stratum, which being strongly illuminated reflects a considerable portion of the light to our eyes, and forms a penumbra, while the solid body of the sun shaded by the clouds reflects none. Later observations, however, have shewn that, what appeared to be the solar surface was but a lower stratum of feebly illuminated matter, and that this has small apertures through which the real surface of the sun is seen of the most intense blackness!

That there is an enormous expendition of heat from the sun's surface is allowed; but the great mystery to account for is by what means this

can be kept up. By the laws of nature, where there is expenditure there is provision for a renewal of energy. That there is a perpetual expenditure of heat from the sun is a matter of every day proof. And at the present season the sun has been most lavish of his energies, sending down on the countries of our northern hemisphere now directed towards him, a more than extraordinary visitation of fervent heat in too many cases fatal to human life. No doubt his varying energies of light and heat as they are expended must be renewed. That those spots or apertures in its illuminated covering are re-supplied is evident since they disappear. In this branch of the enquiry another theory has been advanced by a German astronomer, who considers that an innumerable quantity of asteriods are in perpetual motion round the sun moving in gradually decreasing orbits, so as eventually to bring them within the sun's attractive power, and that they thus become precipitated on the sun's disc. Observations on this subject are however among the desiderata of the day. But however interesting the enquiry must be, and however rare such an observation may be, there is a confirmatory observation of this kind in the transactions of the Astronomical Society, shewing that the phenomenon has been distinctly seen. The subject is yet entirely new, and time can only supply the confirmation of so extraordinary a fact. Should such a phenomenon be corroborated hereafter, as we have no doubt it will be, and those bodies called Asteriods are known to be so numerous as to defy all calculation as to their quantity, they will add another wonderful fact to the history of our solar system, shewing how the Great Author of our universe among other gifts emanating from His power, not only made the great central luminary that was to give light and life to our system of worlds, but as that light by the lapse of ages became expended, that He likewise established an inexhaustible source in the Asteriods by which it was occasionally to be renewed; and surveying all this wonderful forethought and providential care of the Almighty Disposer of all things, how truly may the humble admirer of those works say with the Psalmist, when rejoicing in his blessings in gratitude to the source from whence they came, "I will give thanks unto Thee, O Lord, with my whole heart; I will speak of all thy marvellous works."

The following is an amusing and true picture of our clime and our belongings as given by the *Daily News*, and applicable to our subject:

No sooner had that rare royal visitor, the Sun, seemed half disposed to take leave of an ungrateful country, which could not abide the strange and unfamiliar splendour of his presence, than the British public, with their usual alacrity, began to find out that neither their houses, nor their habits as they lived, nor their clothes, nor their hats, nor their hours, nor anything that is theirs, were adapted to the experience of an Italian summer. Assuming that two months of continuous fervent heat are to become the rule and not the exception of an English summer, we are earnestly invited to reconsider and revise a mode of existence which was naturally prescribed by very different conditions of climate and temperature—by frequent rain, by

heavy dews, by scant and fitful gleams of sunshine, by bleak and blowing days and nights of cloud and damp, by a summer solstice, consisting of three fine days and a thunderstorm, and all the rest of the year neither very hot nor very cold, but showery, close, and shivering by turns. It is all very well to talk about the spacious and airy Italian palaces, their thick walls and marble floors, and to contrast their ample and roomy repose with our hot and stuffy English houses. Taking the average of years, an Italian palace would probably be agreeable in England for fifteen days out of the three hundred and sixty-five, and for the remaining three hundred and fifty days it would be simply uninhabitable. Nor is it much more to the purpose to dilate on the advantages of those narrow streets and lofty dwellings which the Italians built four hundred years ago, not so much against the sun as against each other. Modern Italian streets are not built after the manner of mediæval Siena. There can be as little question of the superiority of a mediæval Italian to a modern London house in any weather, as of the superiority of thick to thin walls, and of large to small rooms. But unfortunately, a large portion of the British public have to live more or less in modern London houses, and all modern London houses are built, or rather are run up, in rows or blocks regardless of any other considerations than site and rent; built all alike of the same cheap bricks and the same lath and plaster, for a brand-new lath-and-plaster aristocracy, whose perfection of comfort is found in heavy carpets and easy chairs, and whose ideal of luxury is the warehouse of an upholsterer. It is not in such houses as M. Haussmann builds in Paris, or in the dreary magnificence of Belgravian mansions, that a real summer or a real winter can be enjoyed or endured. You must go down to the old country-houses to understand the possibility of being cool in summer and warm in winter, in England.

Not that it is the fault of the town houses altogether, even of the new ones. It is much more the fault of their inhabitants. English people, even those who have spent half their lives in India and those who have spent months and years on the continent of Europe, are always taken by surprise by a hot summer in England, just as Italians are taken by surprise by a cold winter in Italy. They have no more notion of keeping an English house cool than Italians of keeping an Italian house warm. They have not even learnt the elementary lesson of keeping rooms dark while the sun is high in the heavens. They think a stream of burning air through all the open windows will palliate the fierceness of the sun's rays. The plain fact is that the English at home are as ill prepared to encounter an Italian summer as the Italians at home to encounter an English winter. What could be more wretched in an English November than one of those palaces which are so enviable in an Italian July? With all their ridiculous defects and superfluities, English houses are, perhaps, better adapted to forty-nine out of fifty English summers than the finest Italian palace would be.

Nor can it be fairly expected that the conventional Great Briton

will change his costume on a sudden because once in half a century or so he has a summer that makes a chimney-pot hat and a cloth coat almost as intolerable as a military stock and bearskin. No variety of weather can ever make the modern costume of the conventional Englishman picturesque or graceful. Probably it bears a rough and instinctive relation to his ordinary climate, and to the respectable fallacies of his social existence. If he could persuade himself to dress like a Pierrot for six weeks, and like a Laplander all the rest of the year, he would be more appropriately, but not perhaps much less ludicrously attired than he is now. Rhetorical exaggeration is the order of the day, and we ought not to be surprised at the periodical clamour about a change of climate, whenever the summer is hot and the winter cold. That is after all the long and the short of the great question which has lately occupied so many ingenious pens in search of a subject.

The answwer to the question "What *is sunstroke*" is well supplied thus from the same source.

New York has the credit of being a sensational city, but it never sent us a more startling statement than that 400 persons had died of the heat in the New York district during five days in the third week of July. We have had a good many cases of sunstroke in England during the heats of the past month, but in New York the malady seems to have become epidemic. Sun-stroke seems to be a kind of apoplexy. It results from congestion of the brain, and the congestion is supposed to be produced by the heat of the sun acting on the back of the head and on the upper part of the spine. The New York papers call for inquiry into it as a new form of epidemic, and they are quite sure that the cause is to be sought in some new atmospheric conditions, and not in their modes of living. But there are at least two things which may be suggested, which either separately or together might probably account for the increase of this complaint on both sides of the water. In our hurrying, anxious, hard-working, city life, with its constant stress upon the brain, multitudes are always on the verge of congestion of that organ, and exposure to the heat may just push them over the border. Then, too, every aid is given to the heat by a custom which originated in New York, and has been imported here, of hurriedly drinking iced beverages. Nothing is more delicious in these hot days and nights than the cold effervescing drinks, iced to freezing point, which are offered us on all hands. But iced drinks should be sipped, not gulped. The intimate connection between stomach and brain is known to everybody, and it must be obvious that to pour an iced draught into the stomach must at once send the blood to the head. Very few who have indulged in the rapid drinking of these beverages have failed to notice that a sudden pain in the head was the result. It may have been a sharp shoot, or a mere feeling of dulness, and may have passed off in a moment, but it was at least incipient congestion of the brain. New York is of all cities in the world the place where iced drinks are most plentifully used, and are swallowed in the greatest hurry—and it is in New York that sudden congestion of the brain has become epidemic.

Polar Magnetism.

A paper has been read before the American Institute of New York that has a more than ordinary charm for the accomplished seaman. Any information on the subject of his compass cannot but be interesting to him; for of that mysterious subject, Magnetism, we have yet to learn much. The author of the paper in question, Mr. J. A. Parker, has propounded his views on the cause of polar magnetism, the attraction of the needle to the pole, the variations of the compass and their incidental phenomena; and by his theories has opened out considerations of a most interesting kind. We will, however, at once transfer his paper to these pages, dividing it into two portions, leaving our readers to their own conclusions. And as we are reproducing this very interesting paper, we prefix to it the following remarks of the author in compliance with his expressed wish. He says:—I respectfully desire the reader of the foregoing to regard the subjects treated of, as in *two divisions.*

First.—The revolution of the magnetic pole round the North Pole, which is based on observations of known data, and of record; and if the record be true, there can be no difference of opinion about the result. It is of *itself*, independently of what follows, a truth of the highest importance to science.

Secondly.—The origin and nature of polar magnetism, and the *cause* of the revolution of the magnetic pole.

This part of my subject is based on reasoning from natural laws, and the conclusions are the inferential consequences of such laws. It is, therefore, more open to criticism than the first division; but the only debatable question is, do the reasons sustain the conclusions? If they do, that ends the discussion, till other and stronger reasons are opposed to it.

The subject stretches over a vast area of natural truth, and therefore on an occasion like the present I must necessarily be very brief on each particular point. I do not propose to examine, criticise, or discuss any of the written theories on the subject, but to limit myself to my own personal observations and reflections, and to draw conclusions only from such phenomena as are manifest to our vision and sense, irrespective of all previous theories and speculations in regard to them. The subject has not only a vast scientific importance, but also a great commercial value, and it is in this latter connection chiefly that, in the first instance, I have been led to consider it.

Some knowledge of polar attraction is necessary to the study of astronomy; it is of national importance, inasmuch as the direction of the needle is oftentimes the arbiter of the lines and boundaries of our national domain, as it is also of our private estates; we rely upon it when, in traversing the continent, we plunge into the depths of the forest, and it is our only safe guide over a trackless ocean, through darkness and tempest, to the haven we seek. Tens of thousands of lives, and hundreds of millions of property throughout the world, are

every hour dependent on it for safety; any inquiry therefore into its causes, and the laws which govern it, is invested with an interest second to no other; and, notwithstanding this, it may safely be said that, in comparison with the whole that may be known, very little is at present positively known concerning it.

The existence of polar magnetism was first revealed to us by the discovery of the compass. There is some doubt as to the exact time of that discovery, but it is supposed to have been first put to practical use by the early navigators in their commerce on the Mediterranean Sea. At that time, and long afterward, the needle was supposed to tend always toward a fixed point in the north; and therefore, when Columbus undertook his voyage of discovery, he was greatly surprised and not a little perplexed to find that, as he sailed westward, the needle gradually changed its direction; and his crew became so much alarmed by it, that all the steadiness of mind which that great navigator possessed was necessary sufficiently to calm their fears to prevent an open mutiny, and thus defeat his enterprise. In later times, by the observations of later voyagers, explained by charts, together with improved instruments for observation, and the means invented for determining the variation at any point, navigation has been made quite safe and certain to the careful and skilful navigator. But, so far as I am informed, the *cause* of these variations of the compass, and the laws which govern them, are wholly unknown to science.

I shall not detain you with a detail of the course of reasoning by which I have, in my own judgment, arrived at a full conclusion in this matter, but state broadly, and at once, what that conclusion is, and then explain some of the evidences on which it rests.

The CAUSE, then, of the variations of the compass, which some have supposed to proceed from the oscillations of the earth, is, in my judgment, THE REVOLUTION OF THE MAGNETIC POLE AROUND THE NORTH POLE.

By the Magnetic Pole we mean that point on the earth's surface within the Arctic circle to which the needle points. By the North Pole, we mean of course the polar axle of the earth on which she turns in her diurnal revolution. And by the variations of the compass, we mean the divergence of the needle's point east or west, from the true north point, with its variableness at different times and in different places.

The revolution of the magnetic pole occurs gradually, through a long period of time, and, according to the best date which I can obtain, is completed only once in about six hundred and forty years. The time may be found to be somewhat longer or shorter when settled by accurate observation.

The exact position of the magnetic pole has never been accurately known. It is known, however, to be at present situated on the North American continent, in a high latitude, and considerably west of the longitude of New York. This was made manifest by the observations of Captain Ross in his polar expedition. He placed the magnetic pole in about latitude 70° 30′ north, and longitude 96° west from Greenwich.

It has changed considerably since that time, and is at present both farther north, and farther west, than he placed it.*

The variation of the compass from the true north point at London or Greenwich is at present westerly. At New York it is still westerly in a less degree, and at the islands in the Pacific Ocean it is easterly. Now, if the accurate variation at each of these points be taken (all local attractions being absent), and lines in the direction of the needle be produced northerly, they will meet at a point not far from 76° north latitude and 118° west longitude from Greenwich. And that point, wherever they do meet, may safely be affirmed to be the present position of the North Magnetic Pole. It is not necessary for our present purpose that we should fix the exact point, nor are the means at hand to do it if needed—it must be done by careful and repeated observations at the same time on different and widely separated meridians, so as to exclude all possibility of error.

The only point necessary for us to determine for our present purpose is, to show that which has already been shown, viz.: that the magnetic pole is situated at a considerable distance from the North Pole, and that being proved, we must now look for the evidence that it REVOLVES ABOUT THE NORTH POLE, which we will proceed to do.

In the year 1658, as shown by the records at Greenwich, the needle pointed due north from that position.† It is, then, certain, that in 1658 the magnetic pole was situated on the meridian of Greenwich, and between Greenwich and the North Pole, or, coinciding with the North Pole, or in a line beyond it, at 180° west. No other supposition is possible. From 1658 the needle began to have a westerly variation at Greenwich, which continued to increase till the year 1818, a period of 160 years, when it had obtained its greatest variation. Now, on the supposition of the revolution of the magnetic pole, it is evident that it would attain its greatest variation when it had passed over 90° in the circle in which it revolves, and that in its progress of revolution the variation would then become less. Accordingly we find that in the year 1818 the westerly variation at Greenwich began to grow less, and from that time to the present has continued to decrease, which is in accordance with the necessity of the case in the supposed revolution.

From 1818 to 1868 are fifty years, in which time, supposing the period of 160 years to have been the exact time in which the magnetic pole, by its revolution, passed over 90° of longitude in the circle in

* That Captain Ross did not quite reach the Pole, is, I think, self-evident, because if the situation of the Pole had been in 70° 30′ north, and longitude 96° west, it would have given a greater variation at London than existed at that time. But that his was the nearest approximation to the truth ever before known, is nevertheless quite certain. Almost at the same period of time, Humboldt placed it in his estimation in latitude 79° north, and longitude 27° west from Greenwich. This was certainly very far from the truth, as the observations of Captain Ross, and all other authentic facts, conclusively show. For myself, I am unable to perceive on what basis of known truths Humboldt could have grounded his opinion.

† Brand's Dictionary of Science, article "Magnetism."

which it revolves, in fifty years it would pass over 28° more, which would place it at this time in longitude 118° W., where it is found to be, as nearly as can be determined.*

[According to the variation chart prepared by Staff-Commander Evans for the epoch of 1858, and published by the Admiralty, the magnetic pole might be concluded to be in about 70° N. lat., and 100° W. long. from Greenwich at that period. Our author says it is now in 116° W. and 76° N. Surely, although a few degrees of longitude in that high latitude are soon traversed, a difference of 5° or 6° of latitude is hardly to be crossed in ten years. At the same time, there can be no doubt that such calculations as those founded on the intersections of the curves of *magnetic variation*, cannot bear the test of close coincidence, and therefore, with a fair allowance for the change of variation since 1858, the conclusions of our author may be received as by no means affected thereby, for even admitting that the magnetic pole may not at present be so far North as he places it, the coincidences indeed are very remarkable.

We may observe also that, although Mr. Parker admits that the magnetic pole is placed *too near* to the pole of the earth, he makes his magnetic poles of 1580, 1658, 1790, and 1868, all at the same distance from it. Those who have given their attention to this subject, and have the facilities at hand of investigating it thoroughly, with the authorities which our national and scientific libraries can afford, have here an opportunity of throwing light on a highly interesting subject. The question in fact is what was the latitude and longitude of the magnetic pole at the several epochs above mentioned. In our little sketch we have placed them all on the seventieth parallel for the sake of merely preserving them conspicuously.—ED. *N.M.*]

Coming now to the longitude of New York (continues the author of the paper before us), although we have no record here going back to 1658, yet we know the fact that the westerly variation is increasing at New York, while it is decreasing at London or Greenwich, and this also is a necessity of the case in the supposed revolution; and if the hypothesis of revolution be true, and the period from 1658 to 1818, when it passed from zero to its greatest westerly variation at Greenwich, be perfectly accurate, then it will continue to decrease at Greenwich till the year 1978, when the needle will again point due north at Greenwich; while at New York (longitude 74° west) the westerly variation will continue to *increase*, and will not attain to its greatest point till the year 1950. And corroborative of all this, supporting the hypothesis of revolution, it is known, that about the year 1790 the needle pointed due north from New York, as it should do, while to-day it has a westerly variation of nearly eight degrees, which again is in perfect accordance with, and

* In placing the Pole at 118° W., I give it the same ratio of progress which it appears to have had for 160 years, viz., from 1658 to 1818. But if we consult the present variation as observed at New York, it would appear to be not quite so far west, or at about 116° W.

indeed an absolute necessity in, the supposed revolution. The period from 1658 to 1790 is 132 years, being the *pro rata* time necessary to pass over 74° of longitude; and here it will be apparent that in 1790, when the needle pointed due north at New York, the magnetic pole was then situated on the meridian of New York, and it is now 44° west of it; thus showing the progress of revolution.

Going still farther west to the islands in the Pacific Ocean, we find there that the variation is *easterly* and growing less, still fully supporting the hypothesis of revolution.

I will mention but one other fact in proof of my position. Dr. Bowditch, in his Navigator, mentions that in 1580 (a period seventy-eight years earlier than any yet mentioned), the needle at London then pointed *eleven degrees and some minutes* EAST. The magnetic pole must then have been situated in about latitude 76° north and 45° *east* from London, and between that time and 1658 it had moved up to the meridian of London. Now, if we add to this the facts already proved, that from 1658 to the present time the magnetic pole has moved from the meridian of London to 118° west of it, and having passed over the meridian of New York, the proposition, that the MAGNETIC POLE REVOLVES ABOUT THE NORTH POLE once in about 640 years, is then, I think, fully demonstrated; and there is nothing lacking in the demonstration but the exact time of the revolution, which, as I have said before, must be determined by future careful and accurate observation. It no doubt may be determined with nearly as much accuracy as the periodical return of an eclipse.*

Two other important facts are also proved by what has been shown. First, that in 1658, when the needle pointed due north at London, the magnetic pole was then situated on the meridian of London, and between that and the North Pole, and not on the opposite side of the North Pole, at 180 degrees; and *secondly*, that the revolution is from

* The only evidence which I have seen going to disprove my hypothesis of revolution, is a remark of Dr. Bowditch, in his Navigator; while, at the same time, giving some dozen or twenty statements of the variations of the compass at different times and different places, all of which are perfectly consistent with, and corroborative of, the truth of my position. He also says that in 1708 the variation of the compass in Massachusetts (probably at Cambridge), was 8° west —in 1742 6° west—and in 1780 2° west. This is not possible with the truth of my position, and one or the other must be in error. If he had said east instead of west, it would have been in perfect accordance. It may be an error of print, or the difference may have been caused by local attraction; but I am more inclined to think that the difference arose from the fact that the observers in these cases *reversed the poles*, and that their meaning was, that the variation of the true north from the needle's point was so many degrees west. If we suppose this to have been the case, and that the variations, as we now define variation, were east and not west, their record would then be in perfect conformity with both the theory and progress of revolution as we have explained it. Such a supposition is not improbable when we consider that 160 years ago the whole subject was but little understood or attended to in this country; and when we reflect that from 1658 to the present time the magnetic pole has occupied 210 years in passing from the meridian of London to its present position, it could not have been in a situation to give a westerly variation at Cambridge in 1708, and the foregoing solution of the Cambridge record is the only one possible.

east to west. Because, had the magnetic pole then been situated on the opposite side of the North Pole from London at 180 degrees (and it must have been on one or the other of these points), and revolving in the ratio as we have seen, in order to produce a westerly variation at Greenwich or London, the revolution must have been from west to east. And although in that case the variations at London would have been precisely the same as they have been, yet in passing over 118 degrees of longitude it would place the magnetic pole to-day in longitude 62 degrees west, where we know it is not, and the variation at New York would have been at present easterly and increasing, instead of westerly and increasing in that direction as we now know it is. It is therefore certain that the revolution is from east to west.

Having now gone so far, and as I believe demonstrated beyond a doubt, the fact of the revolution of the magnetic pole, the subject rises to a higher sphere, and the questions naturally suggested to the mind are, what is polar magnetism? and what is the *cause* of this revolution?

These are lofty questions indeed when we consider the source and influence of the things we are to inquire about, and they are only to be approached with caution and reverence. I will, however, as in the former case, answer these questions at once, as I believe to be the true solution of them, and then give a synopsis of the reasons which direct my judgment to such conclusions.

I regard magnetism as a universal principle, pervading all space, and impressed on all matter, and one of the forces employed to regulate and control the universe; and I consider the revolution of the magnetic pole as being *caused* by magnetic attraction *to the highest centre or system, to which the earth in her various revolutions is immediately related.* The attraction is from centre to centre, and the magnetic needle balanced in its horizontal position becomes an *indicator only of the line of attraction*, and directs itself always to that point on the earth's surface which is in a line with the centre of attraction. There is therefore no absolute polar magnetism, or magnetic pole. It is ideal, not real, and like the earth's axis it is only imaginary, but necessary to be considered in order to illustrate a truth.*

I have said that I regard magnetism as a universal principle, and I so regard it because it is everywhere present in our world—in every place ever visited, in every imaginable position, it is there, possessing the same attributes and exerting the same influence. That which we call a "magnet," however, is not magnetism, any more than an electrified body is electricity—it is simply a magnetized body or substance, capable only of retaining its magnetism for a limited period. Both magnetism and electricity are latent and hidden principles in nature, the very existence of which is a mystery, and of which we know nothing except as we can witness their effects. They are natural forces, and although latent in themselves, they are yet capable of rising to a

* In saying that there is no absolute polar magnetism, I must be understood to mean that there is nothing there, at the pole, to cause the attraction of the needle; its motion is governed by a higher law, and by a force with which the locality of the pole has nothing to do.

force little short of infinite, whenever circumstances combine according to their nature to call them into action. They are not the same, although they may be different phases of the same principle; but I doubt if enough has been learned of either, to justify a decision in that particular. They have many affinities in common, such for example as the attraction of iron—also the power of some bodies to arrest and turn away their current, and of others to receive and retain for a longer or a shorter period an impregnation of their qualities, which is again imparted to other bodies when placed in contiguity or brought into contact. The loadstone is only such a substance, to which magnetism has a strong affinity, and which has therefore the power of absorbing and retaining longer than any other known substance the magnetism it has received.

Both magnetism and electricity may be excited to activity by motion or revolution. Everybody has seen electricity excited by a revolving machine, and if you stand under a revolving belt in a manufactory, you will feel magnetism enough to raise the hair on your head; but no one will for a moment suppose that either magnetism or electricity is created by these motions—they are simply roused from inactivity, as latent heat is rendered active by motion, concussion, or attrition. The difference between the two I conceive to be, that the force of electricity is eccentric, diffusive, and equalizing; that of magnetism is concentric—attracting to the centre.

From all the phenomena which I have been able to see or observe, I have come to the conclusion that what we call polar magnetism is the result of a magnetic force rendered active by revolution. As before stated, the force is concentric attracting to the centre. It is therefore centripetal, and, considered as a universal principle of nature, it identifies itself with that force which astronomers call the "attraction of gravitation," a force known to exist, but for which no satisfactory cause has ever been assigned; and we are here led to ask, what is that force, if it be not magnetism? By whatever name it may be called, we believe it to be the same force which directs the needle to the pole, and which we habitually call "magnetism." That it is a natural force derived from a latent principle, and put in motion by a forward revolution, I think fairly deducible from what is well known to every astronomer, viz., that the magnetic attraction, or "attraction of gravitation," call it by what name we please, in revolving bodies is the opposite of that centrifugal force created by their revolution, *and always equal to it.* And since the motion of the heavenly bodies is sometimes faster and sometimes slower, as proved by Kepler's law, that in passing round their elliptical courses, they pass over equal areas in equal times, therefore the centrifugal force created by their motion is sometimes greater and sometimes less, which must always be met by an equal development of the opposite and concentric force to keep the planet in her orbit. And it is well known that such development is always obedient to the rate of motion of the body revolving. It is evident therefore, I think, that the activity of the magnetic force is produced and regulated by FORWARD REVOLUTION.

That the attraction of the needle is to the centre of the earth, I think is shown by a variety of circumstances. *First*, the shape of the globe is such that direct rays falling upon its surface, necessarily concentrate at its centre, and the attracting force would seem to be of that character; and *secondly*, if a needle be magnetized in but one end, that end will point downward towards the centre, though not at all increased in weight; but if both ends be magnetized, and the needle balanced to a horizontal position, it then points *in the direction of a line with the magnetic current.* For the same reason that the attraction is to the centre, if a compass be placed near the magnetic pole and compelled to keep its horizontal position, it refuses its duty and will turn every way at random; but if left to itself its point tends downward towards the centre of the earth, and this is what is called in navigation "the dip of the needle," which increases always as you approach towards the pole.

From these circumstances it has been sometimes assumed that the interior of the earth is a powerful natural magnet; and even with my theory it is so, though not in the sense as has been supposed; for it will be seen at once that, if the attraction were to the centre of the earth, by a fixed magnet, then there could be no change of variation in the same locality; and as we have seen that such change does take place, that theory is at once exploded.

We prefer, then, to follow our own choice, and assume that the direction of the needle to the pole is only an indicator of a line of higher attraction; and that the immediate motive power is a concentric magnetic force, rendered active and involved by revolution. Let us see then what will be the result.

We will suppose that the revolution of the earth on her axis is the governing cause, or controlling force, the attraction being to the centre of the earth; then the needle being balanced to a horizontal position, would always, and in all places, point due north and south, in a line with the centre of motion; which it never does, except in two places at a time (the antipodes of each other and through their lines of longitude); and there could then be no revolution of the magnetic pole, and no variation or change of variation. We must, therefore, look further for our evidence in support of the truth of our position.

(To be concluded in our next, with an outline of the Arctic Shores.)

LEAVES FROM A JOURNAL.

(Continued from page 407.)

THERE is but little interest either in a passage from Port Royal to Bermuda. A lighthouse on the West Caicos is much required, as the channel is incomparably superior to the Crooked Island. On most occasions a sailing vessel can carry her wind through, and at once reach

the Atlantic. Six or seven vessels are frequently in sight at once, both outward and homeward bound. Steamers from the United States and England invariably use this passage.

Bermuda is my cordial abomination. Its climate, worse than that of Egypt itself, is one of the most depressing in the world; a mixture between the cold fogs of Newfoundland and the sirocco of Malta would give an exact representation of it. Every article of clothing becomes damp and clammy from its effects. It is difficult to dry one's person, to pull on one's boots, or to make one's way between the sheets when southing is in the wind. Shoes or any articles made of leather, which may have been in use, become white with mildew. Some residents complain much of debility as if they too were themselves mildewed. Every species of flower and leaves of vegetables droop or perish in a few hours from blight when the easterly wind sets in during early spring. Why is all this with the East wind? Why should the East wind everywhere be so pernicious to animal and vegetable life?

Here is an island many hundreds of miles from the continent of Europe surrounded by water of equable temperature, yet one wind is dry and bracing, and the other damp and debilitating. The North-west wind which crosses the Gulf Stream is at all times pleasant, and does not appear to take up any moisture on its passage. From this it seems fair to infer that the cold air blowing over the surface of the warm water, immediately condenses the vapour which a warm wind holds in sunshine. As might be expected, there are at times sudden and great falls of rain. In April, 1867, eight and a half inches fell in eight hours, being the greatest on record.

Bermuda appears to be the centre of a system of winds and currents; and cyclones are constantly sweeping over it on their passage to the North-west. During my stay one of these travelled four hundred and fifty miles in seven hours. There seems to be geological evidence to prove that the climate of Bermuda has not altered since the island first rose from the waves. Then, as now, it was swept by the fierce gales which have left us the record of their power in the leaf like structure of the whole strata of rocks in this island. At first the formation was puzzling to account for, as the water is generally of a marvellous clearness. But the fierce gale cleared up the mystery. The heavy sea breaking over the reefs and pounding up the dead coral, soon gives the water the appearance of London milk. When the wind ceases, this matter held in suspension subsides; it sinks to the bottom and becomes firm during the long summer. The general dip of the strata is to the South-west, but in many places it is tilted in various directions, and in a range in height of a few feet it may be seen lying at four different angles of inclination.

Many years since, the sea suddenly flooded a hollow in the island of Somerset. In the course of time, cedar trees there were destroyed, but their stumps in perfect preservation may still be seen at low tide. This part swarms with large mullet, and in consequence of the stumps preventing the hauling of a seine, there is no check to their growth or increase. The opening through which the sea-water flows cannot be

seen, and perhaps might have been caused by some shocks of earthquake. Fishermen say that on the outer reefs the stumps and roots of cedars may still be seen on submerged land, but it never was my good fortune to succeed in obtaining a specimen, although it is not improbable that the group at one time extended much further North than it does at present. The plateau of soundings confirms this, as ships have reported attainable depths with the lead to be found many miles off the island.

On the western shores of Bermuda the sea is slowly hollowing out the low sandstone cliffs, and on the South the gales of winter cause the sand to encroach on the cultivated land. It is said that much has been lost from the selfish policy of felling the large cedar trees which once formed a barrier around this part of the island.

Probably there is no place in this world where the ocean tides can be seen better than at Bermuda. Here they ebb and flow with the greatest regularity, the highest and lowest taking place about the time of the Vernal Equinox. Their greatest velocity inside the reefs does not exceed one mile per hour, except in the narrow channels between the islands where they run fast. Within a radius of one hundred miles from the group, the currents are constantly varying in strength and direction, regulated by the force and direction of the winds. In fine weather Bermuda is seen to its best advantage, presenting an appearance that in some sort redeems its monotony. The sombre green of the cedars, the light sandstone rocks, and the brilliant white houses stand out well against the deep blue sky. The water too is wonderfully clear, and the sea bottom even more interesting than the land itself. Fish of every hue and colour may be seen many fathoms deep playing about the rocks. Sometimes they will disappear in some mysterious cavern below, or pass through a natural archway and reappear some way off. Great sea ferns and frondes of weed meet the eye on all sides, and the beautiful boatswain bird (phaeton phœtherus) balanced in the air overhead, looks like a gigantic opal from the reflection of the sea on his snow white plumage. Like many other beauties however, his are spoiled when he opens his mouth, for his note is most unmusical.

The seafaring population of Bermuda like the inhabitants of most insulated parts of the world have adopted a peculiar form of boat to meet their wants. It has a great beam, a deep keel, and a long heel; the single taunt mast has great rake and is stepped on the forefoot; the mainsail is jib headed, and the jib comes close aft to the mast. The manner in which they carry sail is surprising, yet there is no instance on record of their capsizing. At very long intervals one may fill and go down. The style in which they will shoot through a narrow passage head to wind is surprising, and the slightest touch of the helm causes them to fall off and fill the sails on either tack. It must be admitted that they make the most disagreeable yachts that ever sailed. The foremast being so far forward, and their shortness causes them to pitch and scud heavily, and in working through the reefs where they tack, every two or three minutes one is tossed from side to side without mercy.

There is perhaps nothing that imparts an air of desolation to a place more than the absence of birds. To walk in the woods and not to hear their cheering songs, makes a wilderness of the scene. Here in the summer season musquitos are a great torment. They literally swarm among the dense thickets of cedars and oleander. They are bolder than their brethren in the tropics, and in attacking one appear regardless of their own life. Their numbers are greatly increased from the fact that all the fresh water is caught in tanks and reservoirs.

The Naval cemetery is a pretty little spot, and contains several neat little monuments carved from the stone of the island. They do not stand the weather in such a damp climate without great care. One of the most interesting is a huge square boulder to the memory of several officers of H.M.S. *Winchester*, who were lost on their passage to England in the gun brig *Contest*.

Yellow fever has twice prevailed here with great severity, but I have no hesitation in asserting that it was brought by a ship, as none of the features are present which are believed to generate it, On isolated spots you meet with the graves of convicts, with head-stones erected to their memory by surviving companions, and it is not a little remarkable that some pious text of scripture always closes the epitaph. The establishment was broken up a few years since at the request of the inhabitants, who were alarmed at the outbreaks and weak government of their masters. I have seen a native warder vainly coaxing a lot of broad shouldered, powerful ruffians to do their work. They derided alike his threats and entreaties. Of all places in the world I should say, that under proper guidance, it was best adapted for a penal colony, as there are always large works in course of erection, and few labourers.

Although it may be very well known that this interesting group of islands, known as Bermudas or Sommer's islands, are formed of limestone as well as sandstone, the latter being composed entirely of broken shells, it is a curious fact, for the attention of geologists, that the debris cast up by the winter gales, is continually accumulating at such a rate that a large portion of some districts of these islands is gradually becoming unfit for cultivation, in consequence of being impregnated with sand. Very much of the upper strata is formed entirely of a fine grained sandstone, disposed as regularly as the leaves of a book. These are tilted in exactly opposite directions at many places, mostly about S.S.W. and N.N.E. How often have I contemplated with admiration this interesting process of nature, although much puzzled to account for the formation. And yet it was quite evident, that a certain interval must have elapsed between each deposit to allow the underlying one to harden.

But in March last, we had a very heavy gale of wind from the North-east. In fact, the wind travelled four hundred and fifty miles in seven hours according to the anemometer. It took but a few hours to convert the water, which is generally irregularly clear in a depth of several fathoms, to a mixture as white as milk, and a few hours after

the gale had ceased, this same water became as clear and transparent as before. The matter in suspension had fallen to the bottom, and before the gales of another winter would have become sufficiently hardened on its surface to form a bed for the next deposit to lie on. The inference, therefore, from this, was that when the Bermudas were as yet unformed, similar fierce gales swept over the surface as usual, and it is not a little remarkable that an island should have been uphove at a place which is the very centre of the storms of this part of the Atlantic Ocean.

The different directions which the strata assume in different places are also very singular. On the West side where the sea is gradually eating into the low cliffs, isolated columns of fifteen or twenty feet in height stand out like small islets, affording excellent sections of these deposits. There seems to be good reason for supposing that the plateau on which the Bermudas stand, really extends much further North than is generally believed; as more than one ship has reported soundings of no great depth many miles from the island in that direction.

Some few years ago, the sea suddenly appeared in a deep hollow of about four acres in extent, forming a portion of the island of Somerset. This hollow is really about one hundred yards from the sea shore, and no opening is visible. But as the tide regularly ebbs and flows, a large fissure must exist somewhere beneath this ground. The trunks of numerous cedars, reaching nearly to the water's surface at extreme low tide, may still be seen, and amidst them multitudes of large fish gliding about happily enough between them, in their security from any net with which some astute fisherman might imagine to way lay them. The faces of many of the inland cliffs are covered with carbonate of lime, and these same cliffs appear to me to have once formed portions of caves similar to those which are still to be seen in many parts of this group. As the visitor pursues his walk along the high road, his attention is occasionally attracted by sections on either side of him apparently cut through; while the hollow reverberations under his feet, go far to convince him that he is walking on similar formation. Possibly these were thus left when the islands were lifted above the sea by the strata being tilted in various directions, and thus, also, the opening in Somerset isle may probably have been formed.

In Tucker's Island is a cave of some extent, with stalactites pendant from the roof, and stalagmites rising from the floor. Occasionally they meet, and form pillars, and when lighted up with our blue lights, the effect was very beautiful. This cave cannot be entered directly from the sea. A small boat must be transferred over some intervening rocks and launched into the water of the cave, rising and falling as it does with the tide a little more than four feet at the Springs. Probably there is no place in the world where the wonderful phenomena of ocean tides can be better observed than at the Bermudas. Here they ebb and flow with the greatest regularity, the lowest fall taking place about the time of the Vernal Equinox. The greatest rate of their current inside the reefs does not exceed one mile per hour in calm weather; but, during the prevalence of strong winds, they have been known to run

two. And here, within a range of fifty or a hundred miles, the currents are ever varying in direction and strength; so that this remarkable group appears also to be the centre of an irregular system of currents as well as winds, one being in a great measure dependent on the other. To explain the possibility of a single fossil of any particular bird being found in places far from their haunts, it is worthy of remark, that after a strong westerly gale two birds of the finch species were seen here, which the oldest inhabitants had never before known. These birds must have come from America, a distance of 580 miles in a direct line. It is not probable that the varying wind allowed them to make a direct course, or that it was always favourable to their flights, for they would be hurried along by its violence in its own direction. But the incident proves the wonderful endurance of birds, as well as the great distance they may be carried.

THE LUMINOUS SEA.

(Continued from page 413.)

A DIFFUSED luminous appearance of the sea, in some respects different from what I have seen, has been described by several navigators.

Godehen de Riville saw the sea assume the appearance of a plain of snow on the coast of Malabar.*

Captain Horsburgh, in the notes he gave to Sir Joseph Banks, says —there is a peculiar phenomenon sometimes seen within a few degrees distance of the coast of Malabar, during the rainy monsoon, which he had an opportunity of observing.

At midnight the weather was cloudy, and the sea was particularly dark, when suddenly it changed to a white flaming colour all around: this bore no resemblance to the sparkling or glowing appearance he had observed on other occasions in seas near the equator, but was a regular white colour, like milk, and did not continue more than ten minutes.† A similar phenomenon, he says, is frequently seen in the Banda Sea, and is very alarming to those who have never perceived or heard of such an appearance before.

This singular phenomenon appears to be explained by some observations communicated to me by Mr. Langstaff, a surveyor in the city, who formerly made several voyages.

In going from New Holland to China, about half an hour after sunset, every person on board was astonished by a milky appearance of the sea: the ship seemed to be surrounded by ice covered with snow; some of the company supposed they were in soundings, and that coral bottom gave this curious reflection, but on sounding with seventy

* Mem. Etrang. de l' acad. des Sc. Tom. 3.

† We have recorded similar instances in this work.—*Ed. N.M.*

fathoms of line no bottom was met with. A bucket of water being hauled up, Mr. Langstaff examined it in the dark, and discovered a great number of globular bodies linked together, each about the size of a pin's head.

The chains thus formed did not exceed three inches in length, and emitted a pale phosphoric light. By introducing his hand into the water, Mr. Langstaff raised upon it several chains of the luminous globules, which were separated by opening the fingers, but readily reunited on being brought again into contact, like globules of quicksilver (the globules, he says, were so transparent that they could not be perceived when the hand was taken into the light). This extraordinary appearance of the sea was visible for two nights. As soon as the moon exerted her influence, the sea changed to its natural dark colour, and exhibited distinct glittering points as at other times. The phenomenon, he says, had never been witnessed before by any of the company on board, although some of the crew had been two or three times round the globe.

I consider this account of Mr. Langstaff very interesting and important, as it proves that the diffused light of the sea is produced by an assemblage of minute medusæ on the surface of the water.

In June, 1806, I found the sea at Margate more richly stored with the small luminous medusæ than I have ever seen it. A bucket of the water being set by for some time, the animals sought the surface, and kept up a continual sparkling, which must have been occasioned by the motions of individuals as the water was perfectly at rest. A small quantity of the luminous water was first put into a glass jar, and on standing for some time the medusæ collected at the top of the jar, and formed a gelatinous mass one inch and a half thick, and of a reddish or mud colour, leaving the water underneath perfectly clear.

In order to ascertain if these animals would materially alter their size, or assume the figure of any other known species of medusæ, I kept them alive for twenty-five days, by carefully changing the water in which they were placed; during which time, although they appeared as vigorous as when first taken, their form was not in the slightest degree altered, and their size but little increased. By this experiment I was confirmed in my opinion of their being a distinct species, as the young antiniæ and medusæ exhibit the form of the parent in a much shorter period than the above.

In September, 1806, I took at Sandgate a number of the *beræ fulgens*, but no other species: they were of various dimensions, from the full size down to that of the *medusa scintillans*, on different parts of the coast of Sussex, also at Tenby, and at Milford Haven. I have likewise seen this species in the bogs of Dublin and Carlingford, in Ireland.

In the month of April, last year, I caught a number of the *beræ fulgens* in the sea at Hastings; they were of various sizes, from about the half of an inch in length, to the bulk of the head of a large pin. I found many of them adhering together in the sea; some of the larger sort were covered with small ones, which fell off when the animals

were handled, and, by a person unaccustomed to observe these creatures, would have been taken for a phosphoric substance. On putting a number of them into a glass, containing clear sea water, they still shewed a disposition to congregate upon the surface: I observed that when they adhered together, they shewed no contractile motion in any part of their body, which explains the cause of the pale or white colour of the diffused light of the ocean. The flashes of light which I saw come from the sea at Herne Bay, were probably produced by a sudden and general effort of the medusæ to separate from each other, and descend in the water.

The *medusa scintillans* almost constantly exists in the different branches of Milford Haven that are called pills. I have sometimes found these animals collected in such vast numbers in those situations, that they bore a considerable proportion to the volume of the water in which they were contained: thus, from a gallon of sea water in a luminous state, I have strained above a pint of these medusæ—I have found the sea, under such circumstances, to yield me more support in swimming, and the water to taste more disagreeably than usual—probably the difference of density, that has been remarked at different times in the water of the sea, may be referred to this cause.

All my own observations lead me to conclude that the *medusa scintillans*, is the most frequent source of the light of the sea around this country, and by comparing the accounts of others with each other, and with what I have myself seen, I am persuaded that it is so likewise in other parts of the world. Many observers appear to have mistaken this species for the *nereis noctiluca*, which was very natural, as they were prepossessed with the idea of the frequent existence of the one, and had no knowledge of the other. Some navigators have actually described this species of medusa without being aware of its nature. Mr. Bajon, during his voyage from France to Cayenne, collected many luminous points in the sea, which he says, when examined by a lens, were found to be minute spheres; they disappeared in the air. Doctor le Roy, in sailing from Naples to France, observed the sparkling of the sea, which is usually produced by the *medusa scintillans*. By filtering the water he separated the luminous particles from it, which he preserved in spirits of wine: they were, he says, like the head of a pin, and did not at all resemble the *nereis noctiluca* described by Vianelli; their colour approached a yellow brown, and their substance was extremely tender and fragile. Notwithstanding this striking resemblance to the *medusæ scintillans*, Le Roy, in consequence of a preconceived theory, did not suppose what he saw were animals, but particles of an oily or bituminous nature.*

The minute globules seen by Mr. Langstaff in the Indian Ocean, were, I think, in all probability, the scintillating species of medusa, and on my shewing him some of these animals I have preserved in spirits, he entertained the same opinion.

Professor Mitchell, of New York, found the luminous appearance

* Observ. sur une lumiere produite par l' Eau de la Mer. Mem. Etrang. des Sc.

on the coast of America to be occasioned by minute animals, that from his description, plainly belonged to this species of medusa, notwithstanding which he supposed them to be a number of the *nereis noctiluca*.*

The luminous animalcule, discovered by Forster off the Cape of Good Hope, in his voyage round the world, bears so strong a resemblance to the *medusa scintillans* that I am much disposed to believe them the same. He describes his animalcule as being a little gelatinous globule, less than the head of a pin; transparent, but a little brownish in its colour, and of so soft a texture, that it was destroyed by the slightest touch. On being highly magnified, he perceived on one side a depression, in which there was a tube that passed into the body, and communicated with four or five intestinal sacs.

Many writers have ascribed the light of the sea to other causes than luminous animals. Martin supposed it to be occasioned by putrefaction: Silberschlag believed it to be phosphoric: Professor J. Meyer conjectured that the surface of the sea imbibed light, which it afterwards discharged. Bajon and Gentil thought the light of the sea was electric, because it was excited by friction. Forster conceived that it was sometimes electric, sometimes caused from putrefaction, and at others by the presence of living animals. Fougeroux de Bondaroy believed that it came sometimes from electric fires, but more frequently from the putrefaction of marine animals and plants. But these authors have left their speculations unsupported by either arguments or experiments, and they are inconsistent with all ascertained facts upon this subject.

The remarkable property of emitting light during life, is only met with amongst animals of the four last classes of modern naturalists, viz.: mollusca, insects, worms, and zoophytes.

The mollusca and worms contain each but a single luminous species; the *pholas dactylus* in the one, and the *nereis noctiluca* in the other.

Some species yield light, in the eight following genera of insects: *elata*, *lampyris*, *fulgora*, *pausus*, *scolopendra*, *cancer*, *lynceus*,† and *limulus*. The luminous species of the genera lampyris and fulgora are more numerous than is generally supposed, if we may judge from the appearance of luminous organs, to be seen in dried specimens.

Amongst zoophytes we find that the genera *medusa beroe*,‡ and *pennatula*, contain species which afford light.

The only animals which appear to possess organization for the production of light, are the luminous species of lampyris, elater, fulgora, and pausus.

The light of the lampyrides is known to proceed from some of the last rings of the abdomen, which when not illuminated, are of a pale

* Phil. Mag. Vol. 10, p. 20.

† The animal discovered by Riville off the coast of Malabar, in 1754, is certainly a testaceous insect, and appears to belong to the genus lynceus of Muller.

‡ The luminous zoophyte for which Péron has lately instituted the new genus pyrosoma appears to me to be a beroe and only worthy of a specific distinction.

yellow colour. Upon the internal surface of these rings there is spread a layer of a peculiar soft yellow substance, which has been compared to paste, but, by examination with a lens, I found it to be organized like the common interstitial substance of the insect's body, except that it is of a closer texture, and a paler yellow colour. This substance does not entirely cover the inner surface of the rings, being more or less deficient along their edges, where it presents an irregular waving outline. I have observed in the glow-worm, that it is absorbed, and its place supplied by common interstitial substance, after the season for giving light is past. The segments of the abdomen, behind which this particular substance is placed, are thin and transparent, in order to expose the internal illumination.

The number of luminous rings varies in different species of lampyris, and as it would seem at different periods in the same individual.

Besides the luminous substance above described, I have discovered in the common glow-worm on the inner side of the last abdominal ring, two bodies, which to the naked eye appear more minute than the head of the smallest pin. They are lodged in two slight depressions, formed in the shell of the ring, which is at these points particularly transparent. On examining these bodies under the microscope, I found that they were sacs containing a soft yellow substance, of a more close and homogeneous texture than that which lines the inner surface of the rings. The membrane forming the sacs appeared to be of two layers, each of which is composed of a transparent silvery fibre, in the same manner as the internal membrane of the respiratory tubes of insects, except that in this case, the fibre passes in a spiral instead of a circular direction. This membrane though so delicately constructed is so elastic as to preserve its form after the sac is ruptured and the contents discharged. The light that proceeds from the sacs, is less under the control of the insect than that of the luminous substance spread on the rings; it is rarely if ever entirely extinguished in the season that the glow-worm gives light, even during the day; and when all the other rings are dark, these sacs often shine brightly.

The circumstance of there being points which give a more permanent light than the other parts of the luminous rings of the abdomen has been noticed before by the Comte G. de Razoumouski; he states the number of these luminous points to vary from two to five.*

I must however remark, that I never saw more than two of these luminous points, which were always upon the last ring of the body, and that the figures which accompany the memoir of the Comte de Razoumouski, bear scarcely any resemblance to the insect they are intended to represent, from which we may fairly suspect him of inaccuracy in other particulars.

As far as my observation has extended the small sacs of luminous substances are not found in any species of lampyris except the glow-worm of this country. Thunberg mentions that the lampyris japonica has two vesicles on the tail, which afford light.

* Mem. de la Soc. de Lausanne, Tom. 2.

The organs for the production of light in the genus elater, are situated in the corcelet; these likewise consist of a peculiar yellow substance, placed behind transparent parts of the shell which suffer the natural colour of this substance to be seen through them in the day, and when illuminated, gives passage to the light.

On dissecting the organs of light in the elater noctilucus, I found that there is a soft yellow substance of an oval figure, lodged in the concavity of the yellow spots of the corcelet, which parts are particularly thin and transparent in this species. This substance is so remarkably close in its structure that at first view it appears like an inorganic mass, but with a lens it is readily conceived to be composed of a great number of very minute parts or lobules closely pressed together. Around these oval masses the interstitial substance of the corcelet is arranged in a radiated manner, and the portion of the shell that immediately covers the irradiated substance is in a certain degree transparent, but less so than that which lies over the oval masses; it is therefore probable that the interstitial substance in this situation may be endowed with the property of shining. A fasciculus of the muscles of the corcelet arises in the interior of the oval masses of the luminous substance, but not apparently with any design, as it contributes with the adjacent fasciculi, to move the anterior feet.

In the elater ignitus, the masses of luminous substance are extremely irregular in their figure; they are situated nearly at the posterior angles of the corcelet, and are more loose in their texture than the oval masses of the noctilucus, resembling rather in composition the interstitial substance which surrounds these masses in that species. The shell of the corcelet is somewhat thinner and more transparent along both sides of the margin, than at other places; but it is not, as in the noctilucus, elevated, and peculiarly clear and thin, immediately over the seat of the luminous organ; consequently, the light emitted by the elater ignitus, cannot be very brilliant.

I have not been able to procure any specimen of the elater phosphorea, but from the accounts of naturalists, it appears to resemble in every respect the elater nocticulus; indeed I have great doubts of the phosphorea being a distinct species.

I have had an opportunity of examining, preserved in a moist way, two species of fulgora, the candelaria and lanternaria. The light in this genus has been observed to issue from the remarkable proboscis on the fore part of the head. This part has always been described by authors as hollow or empty, which I have found to be perfectly correct; and what is more extraordinary, that the cavity communicates freely with the external air by means of a chink or narrow aperture, placed on each side of the proboscis. This projection is covered internally by a membrane, between which and the horny part or shell, there appears to be interposed a pale reddish coloured soft substance, that is arranged in the candelaria in broad lines or stripes; but it is so thin, that I could not distinctly examine its structure, or absolutely determine whether it should be considered as a substance intended to furnish the light of these insects or the pigment upon which the colour of the proboscis depends.

The globes of the antennæ constitute the organs of light in the pausus spherocerus. Dr. Afzelius, who discovered the luminous property in this species, compares them to lanterns spreading phosphoric light.* The rarity of the insect put it out of my power to examine its structure, but from the form and situation of its organs of light, it is most probable they are constructed like those of the fulgoræ.

It has been conjectured by Carradori and others, that the lampyrides were enabled to moderate or extinguish their light by retracing the luminous substance under a membrane; but neither in them, nor any of the other luminous insects have I found an apparatus of this sort. The substance furnishing the light is uniformly applied to corresponding transparent parts of the shell of the insect from whence it is not moved; indeed a membrane, if it did exist, would have but little effect in obscuring the light, and never could serve to extinguish it. The regulation of the kind and degree of the luminous appearance, does not depend upon any visible mechanism but like the production of the light itself, is accomplished by some inscrutable change in the luminous matter, which in some animals is a simple operation of organic life, and in others is subject to the will.

It is worthy of remark that in all the dissections I have made of luminous insects, I did not find that the organs of light were better, or differently supplied with either nerves or air tubes than the other parts of the body. The power of emitting light likewise exists in many creatures which want nerves, a circumstance strongly marking a difference between animal light and animal electricity.

With the exception of the animals above-mentioned the exhibition of light depends upon the presence of a fluid matter.

In the phalos dactylus the luminous fluid is particularly evident, and in vast quantity; it is recorded by Pliny that this fluid is like liquid phosphorus, and renders every object luminous with which it comes into contact. Reaumur also found that it was diffusible in water, or any fluid in which the animal might be immersed.†

The shining of the scolopendra electrica, I have always observed to be accompanied by the appearance of an effusion of a luminous fluid upon the surface of the animal, more particularly about the head, which may be received upon the hand, or other bodies brought into contact with the insect at the moment, and these exhibit a phosphoric light for a few seconds afterwards. This fluid, however, I never could discover in the form of moisture even upon the cleanest glass, although examined immediately with the most scrupulous attention by a lens; it must therefore be extremely attenuated. The same appearance has been observed during the illumination of the nereis noctiluca by Fougeroux and Bondaroy.‡

The animal discovered by Riville shed a blue liquor, which illuminated the water for a distance of two or three lines.§

* Lin. Trans. Vol. 4. † Mem. del' Acad. des. Sc. 1742.

‡ Mem. del' Acad. des Sc. 1767.

§ Mem. Etrang. del' Acad. des. Sc. Tom. 3.

Spallanzani relates, that the medusa which he examined, communicated the property of shining to water, milk, and other fluids, on being rubbed or squeezed in them.

The luminous fluid is, in some instances, confined to particular parts of the body, and in others, is diffused throughout the whole substance of the animal.

In the scolopendra electrica, it appears to reside immediately under the integument. In the lynceus discovered by Riville, it is contained in the ovary. If I may judge from my own observations, every part of the body of the medusæ is furnished with this fluid, as there is no part I have not seen illuminated under different circumstances, but Spallanzani affirms that it is only found in the large tentacula, the edges of the umbella, and the purse or central mass; which he proved, he says, by detaching those parts successively, when they shone vividly, while the rest of the body neither gave light nor communicated any luminous appearance to water.

Spallanzani discovered a mucous luminous fluid in the plumule of the pennatula phosphorea.

The phenomenon of animal light has been attempted to be explained in different ways. By many persons it was formerly ascribed to a putrefactive process, but since the modern theories of combustion became known, it has been generally believed to depend upon an actual inflammation of the luminous substance, similar to the slow combustion of phosphorus. Others have accounted for the luminous effect, by supposing the matter of light to be accumulated and rendered latent under particular circumstances, and afterwards evolved in a sensible form.

The opinion of the light of living animals being the consequence of putrefaction, is evidently absurd, and contradictory to all observation on the subject. It has been proved by the experiments of Dr. Hulme and others, that even the luminous appearances of dead animals, are exhibited only during the first stages of the dissolution of the body, and that no light is emitted after putrefaction has really commenced.

Spallanzani, who was the most strenuous advocate for the phosphorescent nature of animal light, stated that the glow-worms shone more brilliantly when put into oxygen gas; that their light gradually disappeared in hydrogen or in azotic gas, and was instantly extinguished in fixed air; that it was also lost by cold and revived by the application of a warm temperature. He conjectured that the luminous matter of these insects, was composed of hydrogen and carbonated hydrogen gas.

Forster relates in the *Lichtenberg Magazine* for 1783, that on putting a lampyris splendidula into oxygen gas it gave as much light as four of the same species in common air.

Carradori has made some experiments upon the lucciole (lampyris italica) which led him to deny its phosphorescence: he found that the luminous part of the belly of the insect shone in vacuum, in oil, in water, and different liquids, and under different circumstances, where it was excluded from all communication with oxygen gas. He

accounts for the result of Forster's experiment, by supposing that the worm shone more vividly, because it was more animated in oxygen gas than in common air.

Carradori adopts on this subject the doctrine of Brughatelli, and ascribes the luminous appearance of animals, to the condensation and extrication of light in particular organs, which had previously existed in combination with the substance of their bodies: he supposes the light to be originally derived from the food, or in the atmospheric air taken into the body; in short, that certain animals have the peculiar property of gradually imbibing light from foreign bodies, and of afterwards secreting it in a sensible form.

(To be continued.)

THE ERUPTIONS OF MAUNA LOA—SANDWICH ISLANDS.

[OUR last number contained some information concerning the great earthquake at Owhyhee of the Sandwich Islands. The local papers contain a connected narrative of the whole transaction, and as an historical record is fit matter for preservation; we have added it to our pages in connection with those related in our volume for 1859.]

The recent volcanic eruption on Mauna Loa has attracted so general interest, that we have collated the principal facts relating to it, and the various accompanying phenomena, so as to embody the whole in as interesting a narrative as is possible. Had we the facilities to illustrate our narrative with sketches taken on the spot, it would doubtless add to the popular interest; but not being able to do so, our readers must be content with the simple unadorned statement. Before describing the late eruption, it may be well to state some facts, which, though well known here, are not remembered abroad.

The only island of our group which has ever, within the memory of man, been known to be in a state of volcanic action, is the largest, HAWAII. All the others are of more ancient formation; while Hawaii is still incomplete. It consists of four principal mountain divisions,—the Kohala range at the north, which are evidently of very old formation, Mauna Kea, an extinct volcano, Mauna Hualalai, on the western coast, which has not been known to be in action since 1801, and Mauna Loa, which is now the only active volcano on the group. Their heights, as measured by Wilkes, are: Mauna Loa, 13,760 feet, Mauna Kea, 13,950 feet, and Hualalai, 10,000 feet.

The following is a list of the eruptions that have occurred on Mauna Loa and Hualalai since the discovery of the group by Captain Cook, in 1778:

1.—*In* 1789, there was an eruption of Kilauea, in which ashes, sand, and pumice stone were showered over the country, and one-third of the army of Keoua destroyed. No details are known.

2.—*In* 1801, Mauna Hualalai was in action for the last time, the stream flowing in a westerly direction to the sea, and extending the coast line. The eruption may have originated near the summit, but the principal crater from which this lava stream flowed is located near the western base of the mountain, six miles from the present shore, and below the mountain road, from which it is quite conspicuous.

3.—*In* 1823, there was an eruption of Kilauea and flow of lava, which reached the sea, twelve miles distant, directly below the crater.

4.—*In* 1832, there was an eruption both of Kilauea and of the summit crater of Mauna Loa. The latter occurred on the 20th of June, and the lava flowed out of several vents on the side of the mountain, probably the northern, as the stream was seen from Maui. This continued for two or three weeks, and is supposed to have entered Kawaihae Bay.

5.—*May 30th*, 1840, an eruption took place in Puna, below and out of Kilauea, flowing into the sea at Nanawale. This stream was eighteen or twenty miles in length.

6.—*January 10th*, 1843, a lava stream issued from the summit of Mauna Loa, north of the old crater of Mokuaweoweo. It took a northerly course towards Mauna Kea, after reaching which, the stream divided, one running for a few miles easterly towards Hilo, and the other north-westerly towards Kawaihae.

7.—*February 15th*, 1852, an eruption broke out very near the source of that of 1843, perhaps a mile or two east, and the stream following the same course as its predecessor, till it reached the low land, when it ceased, after continuing only twenty-four hours. Two days later it burst out some fifteen miles further south-east, directly opposite Hilo, and at an elevation of 10,000 feet. It continued flowing for about one month, running a distance of thirty miles, but did not reach the sea.

8.—*On the 11th of August*, 1855, occurred the most extensive eruption on Mauna Loa that has ever been recorded. The light was first seen on the very summit, and the stream undoubtedly originated in the old summit crater of Mokuaweoweo, and taking a north-easterly direction, ran down towards Mauna Kea, after reaching which it was turned towards Hilo. For thirteen months it continued to flow, filling up ravines and valleys in its course till it came within three miles of Hilo, when it providentially ceased flowing. The extent of this eruption may be judged from the fact that it has been estimated to have flooded an area of 300 square miles, and the quantity of lava thrown out was over thirty-eight billions (38,000,000,000) of cubic feet.

9.—*On the 23rd of January*, 1859, the last great eruption prior to this year, took place on the north side of Mauna Loa, at an elevation of 8,500 feet. The spouting lasted fifteen days, from a crater about 500 feet in diameter, and the flow continued for six months, reaching the sea fifteen miles south of Kawaihae. This eruption, owing to its accessibility, and long continuance, was visited by hundreds of foreigners, including ladies, and probably furnished the most beautiful view of an eruption that has ever occurred here.

These nine eruptions are all that are known to have emitted lava streams during the last ninety years, though it should be added that, prior to 1820, eruptions may have occurred of which no record has been left by foreigners. The summit crater of Mauna Loa has often been temporarily lighted up or covered with dense smoke, which have passed away without being followed by lava streams. To furnish a detailed account of the foregoing is not our present purpose, but merely to give an enumeration of them. The eruption of the present year makes the tenth that has occurred during ninety years, averaging one every *nine years*, which may be assumed as the longest period required for the great fires of Mauna Loa to gather force sufficient to burst forth in their irrepressible conflict. We come now to the

Eruption of April, 1868.

The first symptoms of any unusual commotion on Mauna Loa were noticed on the morning of March 27th, about half-past five o'clock, when from the whaleships at anchor in Kawaihae harbour, a dense column of smoke was observed to rise in one massive pillar to the height of several miles, accompanied with a bright reflection, showing that fire existed in the great crater of Mokuaweoweo. In a few hours this pillar cloud dispersed and passed off, and no light was seen on the following night.

At about 10 a.m. on the 28th, a series of earthquakes began, which continued at intervals with varied severity for over a month. At Kona as many as fifty or sixty distinct shocks were felt in one day, at Kau over *three hundred* in the same time, and near the great crater of Kilauea, the earth is represented as having been in a constant quiver for days together, with frequent vigorous shocks that would send crockery, chairs, lamps, etc., spinning around not in a very pleasant way. Mr. J. Porter. the proprietor of the "Volcano house," says he endured this for several days, as long as he could, till one night about eleven o'clock Pele sent one of Rodman's twenty-inch shot, with a well directed aim, that struck the ground directly under his bed, when he jumped and ran, where or how he hardly knew, but he found himself after a while in the woods safe and sound.

One can readily imagine the state of nervous excitement produced by the continual swaying of the ground, with an occasional shock like that produced by a heavy rock striking the crust beneath him. A lady, who spent two weeks in this shaky region, says that she put her ear down to the earth during one of the "ground swells," and could distinctly hear the rushing and roaring of the lava waves beneath the surface, like the surging of waves in a storm. It was such a scene as unstrung the firmest nerves. Residents of Kau inform us that over *two thousand* distinct shocks occurred there between the 28th of March and the 11th of April, averaging over 140 a day for two weeks.

The earthquakes continued to increase in severity from March 28th till April 2nd, when about four o'clock in the afternoon, one took place that shook down every stone wall, and nearly every stone. frame, and thatch house throughout Kau, and did more or less damage in every

part of Hawaii, while it was felt very sensibly on Maui, Molokai, Oahu and Kauai, the latter island 300 miles distant from the crater. Every church in the district named was destroyed, with perhaps a single exception. The shock was so severe that it threw persons from their feet, and even horses and animals were served in the same way. A gentleman riding on horseback in Kau, found his horse lying flat under him before he could think of the cause. The effect of the shock was *instantaneous*. Before a person could think, he found himself prostrate on the ground. The large stone church of Waiohinu went down in the same way—a sudden jerk, the walls crumbled in and the roof fell flat—all the work of ten seconds. Judge Lyman describes this shock as follows; "Thursday (April 2nd), between four and five p.m., we experienced the *most fearful of earthquakes!* First the earth swayed to and fro north and south, then east and west, round and round, then up and down in every imaginable direction for several minutes, everything crashing around us; the trees thrashing about as if torn by a mighty rushing wind. It was impossible to stand, we had to sit on the ground, bracing with all hands and feet to keep from rolling over." It left nothing but desolation and ruin throughout the district.

Respecting the course of direction of the shocks, we have made many inquiries. Those felt here on Oahu have mostly been undulating, with a wave-like motion. On Hawaii they had three distinct characteristics—the *undulating*, with the motion generally from the north-west to south-east—second, the sudden short, sharp, *jerking shock*, occupying hardly two seconds,—and third, a *thumping*, like a boulder or rock thrown suddenly against the crust of the earth beneath you, and as suddenly falling down. Each kind was frequently accompanied with a *rattling noise*, like distant thunder or artillery, more or less distinct. The lighter shocks generally had no accompanying noise. We experienced one of these "thumping" shocks, while asleep near the crater on the night of the 10th. It sounded precisely as if a cannon ball had struck the floor under us, and then rolled along the verandah. It started us out of a sound sleep. At Kau the motion was often from south to north.

Simultaneous with the heavy earthquake on the afternoon of April 2nd, occurred *The Mad Eruption at Kapapala*, which is so singular, and so unlike anything that has heretofore occurred on the islands, that we give a minute description of it. Kapapala is the residence of Mr. Charles Richardson in Kau, about fifteen miles from Kilauea crater, and twenty-five from Waiohinu. About midway between Mr. R.'s residence and that of Judge Lyman at Keaiwa, six miles west, are two beautiful valleys, that extend from the road a couple of miles, which every observing traveller must have noticed. They were studded with groves of tutui and other trees, and covered with a rich carpet of the softest maniania grass. Herds of sleek cattle were constantly browsing or enjoying the shade of the cool groves. Native huts were scattered here and there, and horsemen were frequently seen crossing the valley.

This was the scene of the "mud flow." Just at the instant the

earthquake occurred, the sides of the valley were rent, and from the fissure burst out, with a terrific explosion, a stream of red mud and water, which was driven by the explosion a distance of fully three miles. This stream was ejected simultaneously with the heavy earthquake from both sides of the valley. Immediately and under and near the fissures are heaps of stones and boulders, which were evidently thrown out first; and beyond these a vacant space, in which a native thatch house was left standing and the inmates left unharmed, while the mud and stones flew over and around them. Eighteen hundred feet from the opening, the pile of mud commences and extends a distance of three miles from the opening, varying in width from half a mile to one mile, and from two feet at the outer edges to twenty and thirty feet deep in the centre. Where it crosses the road it is thirty feet deep and half a mile across.

This mass of mud was thrown out in less than two minutes, as if discharged from two huge batteries of ten thousand twenty-inch Rodman guns, planted on each side of the valley. At its further extremity is a pile of large boulders and stones, that appear to have been driven before the powerful explosion. As it swept through the valley, it destroyed men, animals, and trees alike. Thirty-one lives were lost, and between five hundred and a thousand head of cattle, horses, goats, and sheep, some of which were just at the moment being driven across the valley to the farm house. This mud, or now more properly dirt, as it has become dry, consists of finely pulverized red soil, such as is often found in the group. In some places it is mixed with stones, trunks of trees, fern leaves, etc. Trunks of trees are found standing, with their tops shot off by the explosion. "The force with which those streams were ejected from the hills (says a writer in the *Gazette*) and the speed with which they flowed, is said by eye-witnesses to have been at the rate at least of a mile a minute. The rapidity was so great, even at the very extremity of the flow, that numbers of goats which were fleeing for life were overtaken by it, and found a short time afterwards by Mr. Richardson, sticking by their hind legs in the mud."

Out of the hole where the mud was exploded, now issues a stream of clear, cool mountain water, which it is hoped will continue to flow, as it is the only stream in the district. It will be all the more acceptable as all Mr. Richardson's cisterns have been destroyed by the same earthquake which produced the rivulet.

Some of the natives present at this eruption state that the mud thrown out was cold, others that it was hot, and that steam and smoke issued from the rent after the eruption. It is quite probable that the earthquake created a subterranean rent, which brought this confined body of water in contact with the lava fires below, and thus produced the explosion, without heating the mass above.

Mr. Richardson's loss in cattle, horses, cisterns and houses has been estimated at fifteen thousand dollars, which is probably the largest sustained by any one party. In the valley adjoining there was also a small land slide, but not on the scale noticed above. The soil thrown

out is rich, and will soon be covered with dense vegetation, especially should the fine stream remain permanent.

The Earthquake Wave.—Immediately following the above explosion and the earthquake, there occurred a tidal or earthquake wave, which caused great destruction of life and property along the South-east coast of Hawaii, from Keauhou to Kalae, the most southern point of the island. Judge Lyman, whose residence is six or eight miles from the sea, describes the first view of it as follows: "Some one pointed to the shore, and we ran to where we could see it. After the hard shaking had ceased, and along the sea-shore from directly below us, to Punaluu about three or four miles, the sea was boiling and foaming furiously, all red, for about an eighth of a mile from the shore, and the shore was covered by the sea."

Mr. Fornander, who passed through the district a day or two before the wave occurred, communicates the following to the *Gazette.*

"At Keauhou, the following results of the earthquake on Thursday have been reported. Mr. Stackpole, who had charge of the place, had been up to the Volcano House during the day, and was returning in the afternoon. While descending the pali to Keauhou, the first shock occurred, precipitating an immense amount of earth, stones, and boulders down the pali after him. Escaping these, he arrived on the plateau below the pali, and looked in the direction of the village of Apua, but not a house was to be seen! He then rode down to the edge of the plateau, from whence Keauhou ought to have been in sight, but nothing of it could be seen. Descending to Pahoehoe, he met the men working at Keauhou running up mauka, who reported that nothing was left of Keauhou; that immediately after the earthquake the sea had rushed in and swept off every dwelling and store-house, and all their contents, and that they had barely escaped with their lives. There were some 167 bales of pulu in store, ready for shipment, all of which was swept away. They represent that the sea went up as far as the two basaltic columns indicating the road down to Keauhou—a depth of wave of at least forty to fifty feet.

"At Punaluu, at the moment of the shock, it seemed as if an immense quantity of lava had been discharged into the sea some distance from the shore, for almost instantly a terrible commotion arose, the water boiling and tossing furiously. Shortly afterwards, a tremendous wave was sweeping up on the shore, and when it receded, there was nothing left of Punaluu! Every house, the big stone church, even the cocoanut trees—all but two—were washed away. The number of lives lost is not yet ascertained. All who were out fishing at the time perished, and many of those ashore. A big chasm opened, running from the sea up into the mountain, down which, it is said, lava, mud, trees, ferns, and rocks where rushing out into the sea.

"The same wave that swept away Punaluu, also destroyed the villages of Ninole, Kawaa, and Honuapo. Not a house remains to mark the site of these places, except at Honuapo, where a small "hale halawai," on the brow of the hill, above the village, stood on Friday last. The large cocoanut grove at Honuapo was washed away, as well

as that at Punaluu. A part of the big pali at Honuapo, on the road to Waiohinu, had tumbled into the sea, and people coming from thence are now obliged to take the mountain-road through Hilea-uka.

"The sea swept Kaalualu on Thursday last, as it had swept Honuapo and the other places along the coast, washed away several houses, and killed a number of people—how many, is not yet known. The earth had been shaking almost constantly and severely every day and night. A large land-slide had occurred on the west side of Waiohinu valley, near where Swain's tannery was formerly situated. Fire had been seen in the mountains above, but none had come down on the low lands between Kahuku and Waiohinu when they left, on Monday morning. A large hole, sixty feet in diameter, had opened on the flat below Kahuku, with no bottom visible from the brink of it, and emitting quantities of sulphuric vapour.

"I have just been told an incident that occurred at Ninole, during the inundation of that place. At the time of the shock on Thursday, a man named Holoua, and his wife, ran out of the house and started for the hills above, but remembering the money he had in the house, the man left his wife and returned to bring it away. Just as he had entered the house the sea broke on the shore, and, enveloping the building, first washed it several yards inland, and then, as the wave receded, swept it off to sea, with him in it. Being a powerful man, and one of the most expert swimmers in that region, he succeeded in wrenching off a board or a rafter, and with this as a *papa hee-nulu* (surf-board), he boldly struck out for the shore, and landed safely with the return wave. When we consider the prodigious height of the breaker on which he rode to the shore (50, perhaps 60 feet), the feat seemed almost incredible, were it not that he is now alive to attest it, as well as the people on the hill-side who saw him.

"Mr. George Jones met a heavy loss at Keauhou by the inundation. Besides the houses and fixtures which were swept away by the sea, he also lost some 167 bales of pulu that were ready for shipment. On Saturday last, he chartered the schooner *Old Fellow*, and started in her to see if he could not pick up some of the pulu that might have been washed along the shore, between there and the South point.

"Hilo and Puna have suffered, so far, comparatively least, though the shocks were severe and frequent, and still continue, and the damage to houses and property is very large. But poor Kau is almost wholly destroyed. The sea washed away the coast villages, and the earthquake razed the inland places.

"The number of people now known to have perished between Ninole and Keaiwa (Punaluu and Honamoa included), is 47; at Kawaa, 7; at Honuapo, 27; total, 81, besides a number of the pulu pickers up in the mountains, back of Hilea; how many I am not yet advised, neither have I heard the number of those who perished at Kaalaala."

This was one of those sad catastrophes where "distance lends enchantment to the scene," and which few witnessed. From all we can gather from the above and other sources, the wave rolled in along

the Kau coast from forty to sixty feet high, and receded five times, decreasing in force each successive time. It covered the tops of the lower cocoanut trees, swept inland from five to six hundred yards, and destroyed nearly everything moveable, including the trees growing along the shore. The total number of lives lost during the earthquakes and tide wave was about one hundred.

After these events on the 2nd of April, earthquakes continued to be frequent and alarming, and nothing noteworthy occurred till the 7th, when a lava eruption took place above Kahuka, seven miles northwest of Waiohinu in the district of Kau, which is the most southern district on the island.

How our Seamen Perish.—No Boats on the Davits.

In the month of July, just gone by, a mail steamer left this island for another, and according to a custom too prevalent in the British Merchant Service, stowed all her boats inboard, lashed a spar over them from stem to stern, carefully laced the covers down, and finally lashed down the life-buoys so securely that a knife would be required to clear them away should they be suddenly required for service. Not long afterwards a seaman was employed over the side painting on a small stage secured to the gunwale with small hooks.

The steamer was under all sail and steam, running eleven miles an hour, when a sea struck the stage, lifted one end of it so as to unhook it and thus threw the man overboard. Although he was in his sea boots and other cumbersome gear he swam splendidly, and struck out for the ship. But here, alas, all was confusion. The life buoys could not be released; the boats were a long time in being hoisted out; the oars were not at hand, and the ship's sails could not be readily taken in. Consequently some time elapsed before the action of the screw stopped the vessel's way through the water. It is supposed that fifteen minutes had elapsed before a boat was pulling to the rescue of the man. Still it had almost reached him when he suddenly sank! This is the fourth death from drowning, which has occurred in that ship, in a comparatively short period of time.

If shipmasters insist on sending their men over the side for the purpose of painting at sea, under such circumstances the Board of Trade ought to compel their owners to make their men so employed use cork jackets or life belts. There is no doubt that seamen require to be looked after. They are proverbially careless, but if they neglected to ensure their own safety, where practicable, their commanders should insist on the means of safety being adopted, and the blame should rest on themselves only. In fact it is highly culpable in the Legislature that Passenger ships should be allowed to make ocean voyages without a boat being hanging at the davits ready for immediate use. In bad weather it might be swung inboard, or lowered on the deck, but never allowed to be there when it could be carried with safety in its proper position.

MERCATOR.

Extracts from the report of Captain Close of the Trinity House,

On the Maritime Branch of the recent Paris Universal Exhibition.

In making these extracts we may be allowed to congratulate our friends of the Trinity House in having selected a gentleman so well qualified as Captain Close, not only in his professional attainments but also in general science, for reporting on the various maritime subjects which would come before him. We propose following the present with some further extracts.

France.—*French lighthouse in park.*—The handsome iron lighthouse, erected on rockwork, nearly surrounded by water, on the left of the park entrance from the Pont d'Jena, is to be placed on a dangerous reef off the north coast of Brittany called the Roches Douvres rocks, situated about equi-distant from the islands of Brehat and Guernsey, and about twenty-seven nautical miles from the port of Portvieux. It will stand on the south side of the middle of the reef. The basement of the masonry on which it will be placed is on a level with high-water spring tides, and will be carried up 2·10 metres. The height to the summit of the lantern is 56·15 metres; its diameter at base is 11·10 metres, and 4 metres at the top beneath the lantern gallery. The focus of the light will be 53 metres above high water. The tower is peculiar and elegant in form; the peculiarity of its construction is that its powerful framework is independent of the outer iron coating, so that any portion of its plating may be removed or changed without in any way affecting its strength, enabling, moreover, easy inspection of its plates. It also has the advantage, during erection, of dispensing with all scaffolding, and combines great strength with lightness and economy, the complete building (including the cost of erection, etc.) costing only £10,000. The tower contains, beside coal-bunker and oil-tanks, a kitchen and three keepers'-rooms, and a room for the inspecting engineer. It is surmounted by a first-order revolving light, giving a bright flash every four seconds, the eclipses being nearly double the duration of the flash, which is prolonged by a peculiar arrangement of the upper and lower prisms. The apparatus consists of a polyzonal cylinder of twenty-four sides; the dioptric lens and the two catadioptrics of each face have their axes in the same vertical plane; they have a horizontal divergence of 6 deg., and their maximum intensity is reckoned at 2475 flames. The revolving machinery produces an entire revolution in 1 min. 36 sec. M. Léonce Renault, Chief Engineer of the Ponts and Chaussées, and Mr. E. Allard are the engineers, and M. Rigolet the constructor.

The following lenses are shown in the building, viz.:—

1. A first order fixed lens, varied with sixty-seconds flashes from a second order polyzonal lens, the whole revolving; the sections of the frame and lens of the fixed light being projected in advance of the revolving light in proportion as the diameter of a first order frame is

greater than that of a second order. The idea is to equalise the light from the revolving and fixed lenses by increasing the fixed as a first order and diminishing that of the revolving one as a second order.

2. A lens of alternate flashes and eclipses at intervals of sixty seconds. It is 0·70 in. in diameter, a size between the third and fourth order. It consists of eight polyzonal lenses, with twelve prisms above and four below. The central zone, or polyzone, has six rings; the light is focussed in this lens by means of a long spiral screw from the base of the pedestal to admit of it being used for an electric light. Two of the eight sections open for trimming, etc.

3. A section of a third order light fixed, with shutters outside the lens working from right to left simultaneously by clockwork machinery, creating eclipses in the direction of danger. The machinery and arrangements appear very simple. This apparatus is fitted with revolving machinery.

4. A first order revolving holophotal lens, of twenty-four sections to the circle, similar to the one already described for the Roches Douvres. The glass, both in colour and finish, is very good. The supports and framework of the lower portion are of brass, which makes it costly without increasing its strength. Intended for America. Made by Barbier and Co.

The second lenticular electric apparatus exhibited produces different periods of light. Both are revolving. The first prolongs the flash, and thereby reduces the period of the eclipse, the lenses being placed so as to give a greater divergence than is generally the case, and to avoid as much as possible all vertical divergence, to effect which recourse has been had to the system of double lenses, such as are seen in the Calais and some other French lighthouses. Each of these lenses consists, in the first place, of a sixth order fixed light very well made, with the prisms as small as possible to avoid thickness of the glass.

Around the lower fixed lens a six sided apparatus revolves, each face consisting of a central section of a cylinder, about 30 deg. wide, and the full depth or height of the fixed apparatus. On each side of this central piece are fixed, parallel with it, three refracting prisms, each of the three comprising about 15 deg., thus making each entire face about 60 deg. By focusing each panel about $\frac{1}{4}$ in. beyond the light a greater degree of divergence is given than would be due to the size of the light; this divergence is about 6 deg., consequently each flash should be ten times as bright as a fixed light of the same power as the one employed. The outer apparatus revolves in seventy-two seconds, giving a flash every twelve seconds, and the light interval is to the dark as 1 to 10.

The upper lens has around it a revolving apparatus, consisting of eighteen very thin sections of a cylinder of 20 deg. wide, each without any prisms. The side next the light in these, as well as those in the lower lens, are plane surfaces—the outer only is curved. The focus of these as of the others is behind the light, for the purpose of giving extra divergence. In these the divergence is 5 deg., with a flash four

times as strong as the fixed light; and the proportion of time between the duration of the flash and the darkness is as 1 to 3. The revolving part of this upper lens turns with the same velocity as the lower, which gives a flash every four seconds.

Drawings of the various lenticular apparatus are exhibited in the lighthouse.

The intensity of the flashes is considered to be as follows, viz.—

The flash light	from minimum	13,500	to 20,000	maximum.
The fixed light	„ „	5,000	to 5,000	„
The fixed light, with flashes	„ „	49,000	to 73,000	„
The 30 sec. eclipse light ...	„ „	10,000	to 15,000	„

It is thought these intensities may be doubled by putting both steam-engines in motion.

French harbour lighthouse.—A type of the harbour lighthouse adopted by France is shown on the banks of the Seine. Its height is 8 metres from the base to the platform gallery; diameter at base, 1·71 metres; and at the summit, 1·49 metres.

It is octagonal in form, of T-shaped iron mountings, bent to the desired angle and covering the joints. Its cost is £360. The illuminating apparatus is composed of six annular lenses, partly dioptric and partly catadioptric, producing a flash every twenty seconds. Colza, petroleum, or schist oil may be used in these lenses. The flashes alternate red and white. M. L. Renauld and E. Allard, engineers; and M. Rigolet, builder.

Models of lighthouses.—Among the models of this department are the following:—

3. The lighthouse of Triagoz is represented by a model in relief. It is a third order light, situated on a rocky island to the east of the Sept Isles, in the Channel. It consists of a square tower; on the basement is a vestibule with store-rooms and three keepers'-rooms, the roofs being vaulted; and it has an external gallery. The building was commenced in 1861 and completed in 1864, at a cost of about £12,000.

4. Phare de la Banche, began in 1861, finished in 1865, is situated to the south east of the entrance to the Loire, about 9·500 metres from the land. The height of the building is 26·525 metres, and the focus of the light 21·225 metres above high-water spring tides. The cost of the work amounted to nearly £13,000. Built under the superintendence of M. Chatory and Messrs. Lalley and Britat.

5. This model represents a lighthouse, erected in 1865, in New Caledonia; it is of iron, and in nearly all respects analogous to that of the Roche Douvres, which renders a detailed description of it here needless. It was constructed under the same engineers as the former one.

The following are drawings of various lighthouses, either completed or in process of erection:—

Phare du Créach, established on a reef of rocks lying off the west

point of the island of Ushant. The tower is 43 metres high, built of the stone of the island, pointed with Portland granite, and was completed in 1863, at a cost (lens inclusive) of upwards of £14,000. M. Matrot de Varennes is the chief engineer.

Phare de Conti, mid-distance from Arcachon to Biarritz, on a sand-hill surrounded by a sandy desert, rendering the construction of it a matter of great difficulty. It cost upwards of £7,000.

A drawing claiming attention is that of the lighthouse of Cape Spartel, at the entrance of the Strait of Gibraltar, on the shores of Morocco, at a spot where the Brazilian frigate *Dona Isabel* perished with her crew in 1860.

Many other interesting drawings of lighthouses are exhibited.

As for the floating lights, there is a model of a lightship moored in the roadstead of Dunkerque, called the "Ruytingon" Light. It is built nearly on the lines of our English floating lights, and has little deserving special notice. Its cost was about £5,000.

With regard to the models of buoys exhibited by France, the first four numbers represent beacon buoys, the fifth a mooring buoy. They are made of iron plates on an iron frame, divided into water-tight compartments, so that, should a plate be damaged or become leaky, the buoy would heel over, but the air-tight compartments prevent it sinking. These buoys, both in form and construction, resemble those in use in England, the report on which will serve equally for either. This applies also to the bell buoys.

Model of a beacon on the Antiochc Rocks, Isle of Oleron, consists of four iron cylinders carrying a square iron cage, surmounted by a pyramid, intended as a refuge from shipwreck. Cost about £800. Executed by Mr. Beaucé under M. Leclerc.

A tour balaisé for sea mark and saving life has a tide-gauge and beacon, also a bell rung by the motion of the sea acting on floats. Erected April 20th, 1865, in the Isle of Noirmontier; also in use off Rochelle. The bell and machinery by M. Foucault Gallois, of the Isle of Ré; built by M. Forestiér.

FRAUDULENT SALVAGE.

SIR,—Lloyd's Salvage Association has done a good service to more than one important interest by its exposure of the fraudulent salvage case of the *Olivia*, which was made the subject of an article in the *Times* of the 30th of July; and no one who has looked at this case can doubt, that it is like the index to an unknown quantity, and must agree with the *Times* in thinking that, "owners, and insurers of vessels and cargoes, when apprised by telegraph of disasters, should be more prompt to institute inquiry, and should not grudge the expense of such a proceeding." For in the end, they would be gainers by the suppression of such a system. Whenever it becomes generally known at

all sea ports, that there is a "Vigilance Committee" at Lloyd's, with an experienced Nautical Staff, ready at any instant to investigate a case of wreck or damage on our own or other coasts, there will follow immediately a reduction of fraudulent and extortionate cases, and it would not be too much to expect, that an instance so scandalous as that of the *Olivia*, would cease to disgrace us in the eyes of foreign shipowners, who may well have a suspicion that along our coasts we have a class of nauticals who are only a small remove from wreckers.

The *Times* well remarks that,—"Shipowners and shippers naturally prefer to trade with countries and ports where they and their property are honestly dealt with," but as long as it is "an every-day occurrence" for the channel boatmen "to look upon underwriters as fair plunder," we suffer in national credit and in our mercantile interest, and as the investigation of the *Olivia's* case points to a remedy, it remains with all interested to put it in operation.

W. C. P.

To the Editor of the Nautical Magazine.

We find the following which will be usefully preserved here on the subject of the *Olivia*, under the title of *The Deal Boatmen.*

Our readers will see that the case of the three men, Baker, Middleton, and Spears, tried this week at Maidstone for conspiring to defraud the owners of the ship *Olivia*, has terminated in the conviction of the prisoners, who have been sentenced to six months' imprisonment with hard labour. The facts elicited on the trial were little more than a repetition of those brought out at the inquiry instituted some months since by the Board of Trade, the Captain of the *Olivia* appearing as principal witness for the prosecution. It was proved that on the 21st of April last year, the *Olivia* was boarded off the South Foreland by Middleton and Spears, from the lugger *Briton's Pride;* that Middleton engaged to procure a North Sea pilot; that this pilot, the prisoner Baker, subsequently took charge of the ship; that the port anchor and chain had been lost in the meantime, and that Baker refused to take the ship to sea until they were replaced, notwithstanding that they had the starboard anchor and a spare anchor both bent on to their chains; that an anchor and chain were provided, for which, and for other alleged services that had never been performed, the prisoners obtained the sum of £420 salvage, of which £130 was the sum received for taking off the anchor and chain. These facts are, no doubt, all in the recollection of our readers. The jury, after a consultation that lasted some three minutes, found the prisoners guilty, and the judge sentenced them to six months' imprisonment with hard labour.

Except, perhaps, in the immediate vicinity where the offence was committed, this result of the late trial will meet with general approval. There can be no doubt that the prisoners combined not only to make an exorbitant charge for services rendered, but to charge for services never rendered at all. The disreputable conduct of the master of the *Olivia*, who admitted that he made entries in the log, as to the weather and the danger to the ship, which were deliberately false, in order to

support a claim which he knew to be fraudulent, did not excuse the prisoners or in any way mitigate their offence. The underwriters, in this as in every similar case, are really the parties interested, and if the arm of the law is not interposed for their protection, the business of Marine Insurance will soon become too hazardous to be pursued by prudent men.

The recent prosecution was brought about by Lloyd's Salvage Association, and credit is due to them for the resolute manner in which they followed up the guilty parties to conviction. The charge of £130 for taking off an anchor and chain in moderate weather to a ship in the Downs, although a gross overcharge, was not, as the learned judge pointed out, the real point in the case. It was the claim for the balance of £420—namely, £290—which, with the misrepresentations by which the claim was supported, constituted the true guilt of the prisoners. It was, as the judge observed, "an attempt to put money into the pockets of the Deal boatmen out of the pockets of the underwriters by a claim for "Salvage which was utterly false." Such an offence ought not to go unpunished, notwithstanding that the offenders belong to a class of brave fellows who are ready at any moment to risk their lives to save their fellow-creatures, and ready to do so without fee or reward. But the higher the reputation of the Deal boatmen in this respect—a reputation which the Court did not hesitate to do justice to—the more necessary is it to repress practices which, if suffered to pass unpunished and unchecked, will not only sink that reputation, but involve, as it has to a great extent already involved, the entire locality in obloquy. Regarding the case much in this light, the judge thought it necessary to caution the jury against allowing their minds "to be carried away by a feeling for the bravery of men who spent their lives in saving the lives of others. If, under colour of these services, men committed frauds, they must be punished for the sake of society." The soundness of this will not be questioned. It was necessary that the Deal boatmen should be taught the lesson that they cannot act extortionately and fraudulently with impunity, and that they have no right, for the sake of gain, to involve the whole maritime population of their locality in disrepute. The prisoners, in the present instance, might have been much more severely dealt with had the judge been so minded. We join with his lordship in the hope that the punishment inflicted on these men will have a deterrent effect. There is no doubt that the character which the Deal boatmen have earned for themselves, of taking advantage of ships in distress to plunder the owners, is due in a great measure to the difficulty of procuring convictions in such cases, and the consequent impunity of the offenders. They have found out at last that even a Kent jury will convict, and they will probably profit by the lesson. Useful and brave men as the Deal boatmen confessedly are, they must not set the law at defiance, and justify foreigners in heaping upon our maritime population generally accusations with which, as a community, they cannot be charged.

Formosa, and Islands, etc., East of it.

Remarks on the coast of Formosa, and islands and dangers East of it, by Commander Edward W. Brooker, H.M. surveying vessel *Sylvia*, 1867.

Bearings Magnetic. Variation 0° 20″ *W.* 1868.

Botel Tobago.—The anchorage about half a mile from the beach on the north side of this island, in 21 fathoms, black sand and rock, is but indifferent. A singular shaped needle rock, having an arch through it, is in latitude 22° 5·3′ north, longitude (assumed) 121° 31·1′ E., thus the island is very nearly four minutes farther west than hitherto supposed. The description of Botel Tobago in the China Pilot is accurate, but there is a small conical islet, about 30 feet high, fully half a mile from the shore, on the western side omitted, and also a large islet rock off the north-east end. When circumnavigating the island we found deep water at a mile off shore.

At the time of the *Sylvia's* visit, the island appeared to be densely inhabited, but the people were timid and frightened, refusing all intercourse. Goats, pigs, and fowls seemed to be plentiful, and an extensive cultivation of rice, maize, and Indian corn was noticed. The natives do not appear to be a seafaring people, by the very small canoes that were seen.

Little Botel Tobago is a small high island, about S.S.E. 3½ miles from the southern part of Botel Tobago, with reefs extending for three cables from its north and south ends, showing small detached rocks above water: foul ground appears to extend all round it.

Gadd Rock or Cumbrian Reef.—The position of this dangerous rock is now ascertained to be in latitude 21° 42·3′ north, longitude (assumed) 121° 38·8′ E., Little Botel Tobago bearing from it N. ¼ W. 14¾ miles. It is about half a cable long; a depth of 10 feet water is found off the middle of it, and depths of 30 and 40 fathoms immediately around, and 69 and 127 within a distance of one mile; while between it and the Botel Tobago islands depths of 177 to 69 fathoms were found.

The Gadd Rock is one of the worst hidden dangers known; no indications of it whatever are seen as it is approached. At low water the sea would probably break, but the locality is generally covered by violent tide ripples and smooth whirls, extending more or less the whole distance to the Vele-Rete rocks. The locality of this danger should be carefully avoided.

Vele-Rete Rocks, in latitude 21° 45·1′ north, longitude (assumed) 120° 49·6′ E., are on nearly the same parallel, and about 47 miles westward of Gadd rock, and S. by W. 9 miles from the South Cape of Formosa.

They are a mass of detached, narrow surface rocks. The highest may be seen from a distance of five miles, and with two others are from 15 to 25 feet above the sea, in a N.W. and S.E. direction from each other. At half a mile from them the least depth obtained was 24 fathoms on the south-east side. The channel between them and the south end of Formosa is safe, but heavy tide ripples are often experienced in this and the neighbouring channels, and run so high sometimes that they resemble the sea breaking furiously over a shoal.

The equatorial current in its western course from the Pacific Ocean sets very strongly over these rocks to the N.E., and becomes the Kuro-siwo stream, passing the South cape of Formosa, and the islands of Botel

Tobago, Samasana, etc., causing strong eddies round the points and bays of the islands, and demanding great caution on nearing them.

Samasana Island, in latitude 22° 39·4′ N., longitude (assumed) 121° 28·8′ E., bears N. $\frac{3}{4}$ W. 34$\frac{1}{2}$ miles from Botel Tobago. The north end is a long low point with a double hillock on it, and a pinnacle rock, with a high arch through: there is a small rock a quarter of a mile farther out to the northward. The south point falls abruptly.

The *Sylvia* anchored in the North Bay of this island in 13 fathoms, nearly half a mile from the shore on a rocky and sand bottom: as the current going to the northward sets in a strong eddy round this bay and also round the island, the anchorage is not recommended.

The inhabitants, who are Chinese, and mostly from the Amoy province, say that no European vessel had visited the island since 1840; most probably the last visit was by Captain Sir E. Belcher in 1845. The population then was only 150; it is now considerably more.

The cultivated products of the island are rice, maize, cucumbers, and customary Chinese vegetables and fruits; and from the eagerness shown by the people to barter yams, sweet potatoes, fowls, and eggs, for calico stuffs, they appear to be greatly in need of this article. The communication with China must be very rare.

It is advisable to avoid the lee side of the island, as calms, eddies, and variable winds are likely to cause delay.

Harp Island was searched for, but no bottom obtained with 850 fathoms of line on the position assigned to it on the charts.

East Coast of Formosa.

The South Point of this island in latitude 21° 54′ north, longitude (assumed) 120° 50′ E., is low, and another three quarters of a mile E.N.E. of it, consists of coral limestone. An isolated rock with deep water about it stands up boldly, close to the extreme S.E. point; these rocky points are much perforated by the action of the sea.

Caution.—The attack on the *Dove's* boat when surveying in 1866, the recent murder of the captain and crew of the ship *Rover*, the savage attacks on the boats of H.M.S. *Cormorant*, and also on the *Sylvia's* surveying party, prove the natives of the south end of Formosa to be hostile to strangers; their traditional propensity for the collection of skulls is so well authenticated that there can be little or no hope for the lives of those wrecked on their shore, a misfortune, which, from the large quantities of drift and wreck timber seen there seems to be common.

From recent energetic measures taken by the United States Consul at Amoy, assisted by the Chinese authorities, in consequence of the repeated outrages and murders committed at the south end of Formosa, on shipwrecked crews, by the hostile and savage tribes of that district, these people, through their principal chief (Tokitok), have promised to abstain from molesting strangers in future; and "that they would supply them if in want and receive them in a friendly manner if they landed to procure water or other necessities;" provided that a red flag should be hoisted by "vessels to announce their intention of doing so peaceably."

It was further arranged that a fort should be erected on the heights of Tossupon* as a check on the natives, to form a centre of refuge to shipwrecked mariners. The fort was at once erected, and it has been reported that an English gunboat has seen the Chinese flag flying on it.

* The position of Tossupon hill is not at present known.

Black Rock Bay, in latitude 23° 6·5′ north, and longitude (assumed) 121° 26′ east, might afford shelter from S.W. and southerly gales, but the bottom is rocky and uneven, and a heavy swell would always roll round the point. The Black rocks are two masses of coral limestone 120 feet high, nearly touching each other, with a little verdure on their summits. The island of which they are a part is scarcely joined to the mainland by a number of detached rocks and reefs. The *Sylvia* anchored in 13 fathoms, with the rocks bearing E.S.E., three quarters of a mile.

Sau-o Bay affords excellent shelter for vessels on this coast during the N.E. monsoon. The bay is about three quarters of a mile wide at the entrance, and a mile deep, with two small bays; that in the southern corner is a sheltered nook, called Lam-hong-ho, but with shallow water, and only available for vessels of light draft (9 feet and under); that in the N.E. corner is named Pak-hong-ho, and would shelter one or two vessels in 5 fathoms from all winds, except those from South to S.E., which seldom blow, excepting in the months from June to September, when S.E. winds prevail.

Breaker Reef (or Tong-sim-tai) consists of coral about two cables in extent, N.E. and S.W., rather more than half a mile from the shore and nearly in the middle of the bay; parts of it are uncovered and others awash. At the north-east end of the reef are two conical rocks, the highest being 31 feet above the sea. This reef by breaking the sea and swell affords the only safe anchorage in the bay for vessels above 10 feet draft of water, and one where a ship, well found in ground tackling, would ride out a gale.

The space between the south end of Breaker reef and the rugged point Si-ho-mai, is full of rocks, carrying from 4 to 6 feet only over them, and although greater depths of 2, 3, 5, and 6 fathoms are also found, the channel is *not safe for any vessel* to take.

Sau-o or Arlyi Rocks.—The westernmost and largest rock, 98 feet high, bears N.E. 1¼ miles from the south point of Sau-o bay, and E. by S. two-thirds of a mile from the north point; from it two other rocks bear E.N.E. 2½ cables.

Between these rocks and the north point there is deep water, but the uneven bottom, which is rocky, and the foul ground extending more than half a mile from the north point, render the channel dangerous.

Supplies.—The inhabitants of this bay are mostly Chinese fishermen, several domesticated aborigines living with them. Fresh supplies were obtained from them, at first in small quantities for exorbitant demands. But subsequently an abundance came off to the ship, at more moderate prices. Should the bay become a treaty port, from the rich and well cultivated plain of Kapchulan, only a few miles to the northward, it must be capable of adequately supplying all wants of shipping.

Directions.—Approaching Sau-o bay from the northward, pass half a mile eastward of Sau-o reef, the highest rock of which can in clear weather be seen from a distance of 8 or 10 miles. When Breaker reef bears W. ¼ N. haul up for it. From the S.E. vessels may boldly approach the south point, as it is steep to.

The depths in the outer part of the bay increase gradually, from 11 and 12 fathoms between the inner points, seaward to 17 and 20 fathoms, and decrease gradually towards the beach.

Anchorage.—There is good holding ground in the outer part of Sau-o

bay in 13 fathoms, black sand and mud, but it is unsafe with easterly winds. The best anchorage is under Breaker reef, but in rounding its north end, give it a berth of two cables to clear a rock with 2 fathoms water 1½ cables N.W. of the highest rock on the reef. The clearing mark is the easternmost rock of the Sau-o reef in line with a conspicuous rocky islet off the north point. A vessel may then haul up for the reef, and anchor in 5 or 6 fathoms, with the conical or high rock E.S.E. about 2½ cables.

Tides.—It is high water F. and C. at 5h. 50m., rise 3 to 6 feet. The tidal streams are weak in the bay; the flood sets along the coast south, and the ebb north, rate 1½ knots per hour.

Kelung.—The rock reported to have been struck by the ship *Vindex* has been carefully searched for by H.M. Ships *Serpent* and *Sylvia*. They reported it to be a rock on the western edge of the coral banks to the southward of Bush island, and from which it is 3½ cables; the obstruction said to be in the entrance of the harbour, *does not therefore exist.*

Permission and instructions to H.B.M. Vice-Consul at Tamsui have been received from the Chinese authorities, to place beacons and buoys for facilitating the approach and entrance of this harbour, when they are completed, notice will be given. The navigating marks will consist of a *white* beacon on Image point, and a *black* staff and ball beacon on the western edge of Bush island. These beacons will mark the entrance to the harbour, and in the thick weather of the N.E. monsoon will very clearly indicate its position.

A *red* buoy will be placed near the rock on the western edge of the coral patches, and a *white* buoy off Ruin Rock point.

Caution.—In consequence of ballast having, for many years, been thrown overboard from the numerous junks frequenting the port, the head of the harbour above Ruin Rock point, and towards the town of Kelung, has shoaled considerably, and much less water will there be found than is shown in the Chart.

Tamsui is formed between the high range (2,800 feet above the sea) to the N.E., and a remarkable double hill (the north peak of which is 2,014 feet above the sea) to the S.W.; the entrance has a bar of 7½ feet water, but within it the depth increases to 3½ fathoms.

Six miles from the entrance of this harbour the main branch of the river Tamsui runs to the south-east, with a smaller branch to the southward; that to the south-east, has on its right bank, about 13 miles from the entrance, the town of Mangkia, or Bianca, the largest town in the north part of Formosa. Numerous tributary streams feed this river, which has its source in the high mountain range in the south 70 or 80 miles from the harbour. The highest peaks of this range attain an elevation of 12,000 feet.

The confluent branch takes a turn at Kang-tow point (6 miles from the entrance), and after several small rapids ends a few miles from Kelung.

Produce.—Level tracts of rich soil extend to the foot of the thickly wooded mountains and are well cultivated, affording abundant crops of rice, maize, sugar, sweet potatoes, etc. The prohibition to export rice having been withdrawn, hopes are entertained that the present prohibition on camphor, camphor-wood, sulphur, etc., will soon follow.

The extensive coal mines of Kelung, with a better system of working would produce an excellent and cheap supply of coal, but much requires

to be done to develop the resources of an island, which is believed to be rich in minerals and natural produce.

A large trade is carried on between Tamsui and the Fu-kyan province of China.

Supplies.—Bullocks, pigs, goats, poultry, and vegetables abound.

Tides.—It is high water, F. and C., in Tamsui harbour at 11h. 45m., spring rise 7 to 10 feet.

Directions.—The anchorage off the harbour is unsafe, holding ground bad; and a vessel, with a good scope of cable out, is likely to drive, even in moderate weather. The wind freshening from the north-east sends in a heavy sea which breaks even in 3 fathoms. Hence a sailing vessel must immediately proceed to sea, for should the wind veer to north-west it would be too late.

The recent survey in the *Sylvia* shows that the deepest water over the bar is nearly in the same direction as when Lieutenant Gordon surveyed it in 1845. The present mark for entering the harbour is a small fish hut, on piles, near White fort, just open to the right of the old Red brick square Dutch fort, both situated on the northern side of the river. A *white* beacon is about to be placed near the fish hut, as a leading mark.

Caution.—As the bars at the mouths of river-harbours are liable to shift from the effects of the freshets caused by heavy rains, and new channels to form, no vessel should enter Tamsui harbour for the first time without a pilot; one can generally be obtained off the port. The northern bank must be kept close on board when running up. The anchorage for large vessels is off the custom house, and along the north shore seaward. Vessels must moor, and should have spare anchors ready in winter months, as the river freshets then are so strong, after continuous rain, as to drift a vessel out and wreck her on the bar. Otherwise the harbour is secure against all winds.

Currents.—In September, 1867, H.M.S. *Sylvia*, about 3 miles off the coast, found a strong ebb stream setting to the north-eastward, at the rate of 2½ or 3 miles an hour. This stream runs round the north point of Formosa, and creates a turbulent ripple off Foki point.

The flood stream runs to the S.W., past the port of Tamsui, at the rate of 2 miles an hour; both flood and ebb streams take a direct course over the bar, and in the river.

West Coast of Formosa.

Wanckan to Quang-wa.—From the hut on the sandy patch of the Wanckan banks (the westernmost part of Formosa) to the northward, the coast is low and has no distinguishing feature, the bushes and huts being only a few feet above the land.

This uninteresting seaboard becomes even more dreary at low water, when the mud and sand flats dry out many miles; outside of which again is shallow water with 3, 4, and 5 fathoms, and again greater depths of 10 to 15 fathoms. The currents, however, are very strong, and ships should therefore not approach this part of the coast in less than 10 fathoms.

Quang-wa is about 26 miles N.N.E. ½ E. from the Wanckan hut; between them are the small villages of Balian, Sei-kiang, and Mon-kiang, at the outlet of which latter is a mountain stream, nearly closed by a bar of sand.

The country at the back appears cultivated; but as there are many sand

hills, and the coasting villages are inhabited by very poor people, existing chiefly on shell fish, any produce must be very limited.

Several junks were seen about the coast, and at low water were high and dry on the flats.

At Quang-wa in an inlet through the flats at low water junks appear to be safe, but when the N.E. monsoon sends its heavy sea down this coast, they cannot then be secure.

From Quang-wa to Lo-kiang, a distance of about 10 miles;—the coast still continues low, and the mud and sand flats uncover at low water, further from the land than at any other part of the coast.

Rather more than 4 miles to the westward of the town of Lo-kiang, is a small inlet marked by two bamboo beacons; a great number of junks find anchorage and shelter here, but most of them ground at low water; they communicate with Lo-kiang (a large straggling town) by boats.

Lo-kiang to Goche.—From Lo-kiang the coast trends N.N.E., with extensive mud and sand flats drying at low water; but beyond the village of Goche the water deepens nearer the shore, and the flats at low tide reach out from a quarter to half a mile from it.

The plains and level land about Lo-kiang and to the northward of it are densely inhabited by a thriving people, who, by exporting rice, etc., seem to give ample employment to the numerous junks which trade between the Fu-kyan province of China and this coast; but the Chinese who inhabit the villages to the southward of Lo-kiang are wretchedly poor, and appear to subsist entirely on shell fish.

Goche is on the coast about 13 miles to the northward of Lo-kiang: here, the coast range of hills recedes to about 3 or 4 miles from the shore, and takes a south direction; the ridge which in general is quite barren is in fact a spur of the higher range of hills, leaving a triangular tract of land between it and the sea, having the Wanckan reef for the apex of the triangle, of which the foot of the hills is the base, at a distance of from 25 to 35 miles.

A vessel approaching this coast should not near it within 5 or 6 miles. Thus the land will be seldom visible except at sunrise, when the bold outlines of the central hills may be seen from a great distance. The highest peak of these, Mount Morrison, is 12,800 feet above the sea, in latitude 23° 27·2′ N.; longitude (assumed) 120° 58′ E. The height of the general mountain range varies from 9,000 to 12,000 feet, and at its north extreme is a remarkable hat-shaped peak of 11,300 feet, now called *Mount Sylvia*. Dense forests cover the whole, and where the lesser ranges, with spurs, approach the coast about Goche and to the northward, the plains are so abundantly watered by various streams that little or no difficulty is experienced in producing rich crops of rice, maize, sweet potatoes, etc. The principal town in this district is Tyka, large and well built, and surrounded by a wall.

About a mile N.E. of Tyka, is a remarkable square topped hill 743 feet above the sea, visible in all directions, and, with another named Stone peak, 500 feet above the sea, to the southward of Tyka, form the most striking features on the coast.

Tongsiau a single peaked hill is 239 feet above the sea. This was the last position of the survey of the north-western coast made by Lieutenant Gordon in 1850, and the first in continuation in the *Sylvia*. It is about half a mile inland, and overlooks a picturesque valley, through which a

considerable stream winds past several villages. This stream has, at high water, an entrance enabling junks to pass in easily. The first village on its banks is the large one of Tongsiau.

Petroleum springs have been discovered by Mr. Dodd (a resident merchant at Tamsui), 15 or 20 miles inland, and a few miles beyond the first flat topped ridge; but unfortunately they are in the district of the *raw savages*, as the aborigines are called.

Directions—Off Wanckan and as far as Goché, a distance of 50 miles, the coast being low, and soundings shallow and irregular, ships should not stand into a depth of less than 10 fathoms, and should also bear in mind the strong tides which run round the Wanckan banks and reefs. From about 3 miles north of Goché to Tongsiau the coast can be approached to one mile, where depths of not less than 10 and 12 fathoms will be found. The tides along this coast are not so strong as off Wanckan.

Weather.—The *Sylvia* was engaged off the coasts of Formosa from June to September, and during the whole time experienced very fine weather, the south monsoon being a gentle breeze. The average temperature was 84°.

Tides.—It is high water, F. and C., at the Wanckan at 9h. 45 m., spring rise 10 to 12 feet; and at Tongsiau 10h. 0m., rise 8 to 10 feet.

ERRATA IN HYDROGRAPHIC NOTICE No. 16, 21st August, 1867, relating to Japan.

At page 5, paragraph headed *Tides of Bingo Nada*, for the times of high water full and change, read,—(See *Nautical Magazine* vol. xxxvi. p. 584).

	h.	m.	
St. Vincent Channel	11	27	flood west, ebb east.
Takami	11	35	,, ,,
Mutsu Sima	11	45	direction uncertain.
Middle of Bingo Nada	12	0	,, ,,
Imahara	11	0	flood east, ebb west.

POSITIONS OF ISLANDS IN THE PACIFIC OCEAN.

Harbour-Master's Office, Honolulu,
May 25th, 1868.

DEAR SIR,—I send you the positions of the Gilbert, Marshall, and Ralik Groups, selected from the best authorities, and arranged by the Rev. L. H. Gulick, who resided on Ebon Island for ten years. Dr. Gulick having visited a great many of the groups, has had the best opportunity of judging of the accuracy of former navigators, and from his knowledge of the language spoken by the natives, he is the best authority for the names given by the natives to the various groups or atolls, which, in all the charts I have seen, are very much confused. Dr. Gulick has kindly loaned me his journal for my perusal (which is well worth publishing), from which, with his permission, I copy the following:

Positions of the Gilbert, Ralik, and Marshall Islands.

Names.		Lat. S.	Long. E.	Authority.
Arorai Atoll, Hope or Hurd's Island	S. pt.	2° 41′	177° 01′	M. Dutaillis, in Finlay's
	N. pt.	2 37	176 57	Directory.
Tamana Atoll, Chase, or Phebe Island	centre	2 35	176 15	Capt. V. Smith.
	S. pt.	2 28	176 00	Capt. Handy.
Oneke Atoll, Clerk, Rotch, or Eliza's Island	centre	1 50	175 30	Capt. V. Smith.
	„	1 55	175 49	Capt. Handy.
Nukunau Atoll, or Byron's Island	centre	1 25	176 45	Capt. V. Smith.
	„	1 25	176 35	Capt. Handy.
Peru Atoll, Francis, or Maria Island	centre	1 25	176 15	Capt. V. Smith.
	„	1 15	176 00	Capt. Handy.
Tapitouwea Atoll, Drummond or Bishop Island	S.E.pt.	1 28	175 13	Wilkes' Chart.
	NW. p.	1 08	174 50	„ „
Nonouti Atoll, Sydenham's, or Blaney's Island	S.E.pt.	0 45	174 30	„ „
	S.W.p.	0 45	174 23	„ „
	N. pt.	0 30	174 20	„ „
	W. pt.	0 35	174 15	„ „
		North.		
Aranuka Atoll or Henderville's Island	S. pt.	0 10	173 40½	Wilkes' Chart.
	N.E. p.	0 13½	173 41½	„ „
	W. pt.	0 11½	173 35½	„ „
Kuria Atoll or Woodle's Island	S. pt.	0 12	173 27½	„ „
	N. pt.	0 17	173 26½	„ „
	centre	0 14	173 27	Capt. Handy.
Apamama Atoll or Hopper's Island	S.W. p.	0 26	173 51	Wilkes' Chart.
	S.E. p.	0 21	174 01	„ „
	NW. p.	0 30½	173 54	„ „
Maiana Atoll, Gilbert's or Hall's Island	N. pt.	1 02	173 04	„ „
	S. pt.	0 51	173 03½	„ „
	E. pt.	0 58	173 08	„ „
	W. pt.	0 55	172 59	„ „
	centre	0 58	173 06	Capt. Handy.
Apaiang Atoll or Charlotte's Islands	S. pt.	1 44	173 07	Wilkes' Chart.
	N. pt.	1 58	172 59	„ „
	NW. p.	1 54	172 55	„ „
	centre	1 50	173 04	Capt. Handy.
Tarawa Atoll or Knoy's Island	S.E.pt.	1 22	173 12	Wilkes' Chart.
	S.W.p.	1 22	173 00	„ „
	N. pt.	1 29	173 03	„ „
	centre	1 30	173 06	Capt. Handy.
Marakei Atoll or Mathew's Island	mid S p	1 58	173 25½	„ „
	N. pt.	2 03	173 34	„ „
	centre	2 00	173 25	„ „
Butaritari Atoll or Tonching Island	S. pt.	3 01	172 45	Wilkes' Chart.
	N.E. p.	3 10	172 56	„ „
	NW. p.	3 13	172 40	„ „
	centre	3 08	172 50	Capt. Handy.
Makin Atoll or Pitt's Island	NW. p.	3 20	172 57	Wilkes' Chart.
	centre	3 20	172 50	Capt. Handy.
		South.		
Benabe Atoll or Ocean Island	centre	0 52	166 50	Capt. Handy.
	„	0 52	168 24½	M. Dutaillis.
	„	0 48	169 49	Capt. Cheyne.
	„	0 50	169 45	Capt. V. Smith.
Newodo Atoll or Pleasant Island	centre	0 25	167 05	Capt. Handy.
	„	0 25	167 05	Capt. Cheyne.
	„	0 25	167 20	Capt. V. Smith.

Names.		Lat. N.		Long. E.		Authority.
Milli Atoll or Mulgrave Island ...	S.W. point	6	09	171	30	Duperry.
	N.W. point	6	20	171	28	,,
	Tokowa Islet	6	15	171	56	Dutaillis.
	Jabunwuni	6	20	171	52	Capt. Brown.
	S.E. point	5	58	172	02½	,, ,,
	S.E. point	5	59	172	02	U. S. Ex. Ex.
Majuro Atoll or Arrosmith	S.E.pt.	7	05	171	23	,, ,,
	W. pt.	7	15	171	00	Capt. Brown.
Arhno Atoll, Daniel, or Peddes Island	N.E.p.	7	30	171	55	U. S. Ex. Ex.
	S.W.p	7	11	171	40	,, ,,
Awrh Atoll or Ibbetson's Island	N.E. p.	8	18	171	12	Kotzebue.
Maloclab Atoll or Kaven Island	S.E.pt.	8	29	171	11	,,
	NW.il.	8	54	170	49	,,
Erikub Atoll or Bishop Junctian Island	S.E.pt.	9	06	170	04	,,
Wotje or Otdia Atoll or Romanzoff Is.	Anchorage within the					
	N.W. point	9	33	170	10	,,
	E. point	9	23	170	16	,,
Likieb Atoll or C't. Heiden Island	centre of group	9	51½	169	13½	,,
	N.W. pt.	10	03	169	01	,,
Jemo Atoll or Steeple Island	centre	9	58	169	45	,,
Ailuck Atoll, or Tindall, or Watt's Island	N. pt.	10	27	170	00	,,
Mejit, Miadi Atoll, or New Year's Island	centre	10	08	170	55	,,
Uterik Atoll or Button Is.	centre	11	20	169	50	Capt. Brown.
Taka Atoll or Souworoff Is.	centre	11	05	169	40	,, ,,
Bikar Atoll or Dawson's Island	mid. of group	11	48	170	07	Kotzebue.
Ebon Atoll or Boston Island	centre	4	39	168	50	Hazemeister.
	,,	4	30	168	42	Capt. Cheyne.
	,,	4	34	168	45	Capt. Handy.
Do. do. anchorage within S.W. pt.		4	39	168	49	Capt. Brown.
Namorik Atoll or Baring's Is.	centre	5	35	168	18	Capt. Handy.
Kili Atoll or Hunter's Island	centre	5	46	169	00	Capt. Dennet.
	,,	5	40	169	15	Capt. Handy.
Jaluit Atoll or Bonham's Island	W. pt.	6	00	169	30	Duperry's Ch.
	N. pt.	6	17	169	10	,, ,,
	N. pt.	6	22	169	22	Capt. Brown.
	S. pt.	5	47	169	36	,, ,,
Ailinglablab or Muskillo Group	S. pt.	7	15	163	40	Capt. Cramchenko, in Finlay.
Middle lobe	S. pt.	7	46	168	23	,, ,,
Isthmus containing.....	N. and mid. p.	8	00	168	13	,, ,,
	N. pt.	8	10	168	00	,, ,,
Jebwat or Tebut Atoll ...	centre	8	25	168	17	Kotzebue.
Lib. Atoll or Princessa Is.	centre	8	20	167	30	Capt. Dennet.
*Namo Atoll or Margaretta Island.....	S. ex.	8	55	167	42	
*Kwajalen Atoll or Catherine Island	N.Islet	9	14	167	02	
Lae Atoll or Brown's Island	centre	9	00	166	20	Capt. Brown.

Names.		Lat. N.		Long. E.		Authority.
*Ujae Atoll or Lydia Is.	centre	9	04	165	58	Ship *Ocean*.
*Wotto Atoll or Shanz Is.	centre	10	05	166	04	Capt. Shanz.
Ailinginae Atoll or Remski-Korsakoff Island	S.W. p.	11	08	166	20	U. S. Ex. Ex.
	S.W. p.	11	08	166	26½	„ „
Rongerik Atoll Island.....	E. pt.	11	26½	167	14½	Kotzebue.
	centre	11	14	166	35	U. S. Ex. Ex.
Rongelab Atoll or Pescadores Islands	centre	11	19	167	35	Kotzebue.
	„	11	20	167	30	U. S. Ex. Ex.
*Bikeni Atoll or Escachottz Island	W. point	11	40	166	24	(165° 24′) Kotzebue.
	cen. S. p.	11	33	165	37	Capt. Brown.
	W. part.	11	59	165	00	Duperry's Ch.
Eniwetok Atoll or Brown's Islands	Parry's Islet	11	21	162	52	Horsburg.
	N. point	11	40	161	05	Lutke's Chart.
	centre S. line	11	20	161	05	„ „
Ujilong Atoll or Morning Star Group	centre	9	52	160	56	Capt. James.
Ujilong Atoll or Kewley Group	S. end	9	47	161	15	Capt. Kewley.

* These Islands require further examination. DANIEL SMITH.

TOBACCO.—Dr. Willard Parker recently delivered a lecture on the use of tobacco, from which we extract the following:

Nicotine, he said, the alkaloid of tobacco, which imparts to the weed all its power as a stimulant, is one of the most deadly poisons. One drop of it will cause immediate death. This virus gradually permeates the body of the smoker. A skilful eye and touch can easily detect its presence even in the skin. The reaction from this, as from every stimulant, occasions a depression of spirits, which craves other stimulants. A striking confirmation of this is found in the fact that no inebriate in our asylums can be reformed till he abandons the use of tobacco. Thus experience shows that the depressing effect of the weed makes the temptation to drink irresistible by the reforming inebriate.

In France, quite recently, it was ascertained by the Government that from 1812—1832, the yearly revenue from tobacco was 28 millions of francs, and the number of lunatics and paralytics in the kingdom was 8,000; while now this revenue is 180 millions of francs annually, and the lunatics and paralytics number 44,000. The Emperor, in order to discover whether there was any proper connection between these two statistical items, ordered that in all the colleges a competitive examination should be instituted between the smoking and non-smoking pupils. The non-smokers, as a rule, were found to be vastly superior to their competitors in all attainments; and an edict from the Emperor broke, in one memorable day, 30,000 pipes.

Dr. Parker said that in all his professional practice he had never known a man among the employes of a tobacco manufactory to be perfectly sound and healthy. To all outward appearance they seemed strong; but let them meet with an accident, or from any cause need medical treatment, and it was found their recuperative power was greatly enfeebled. The offspring of the users of tobacco also inherit the taint of their parents.

Nautical Notices.

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

Particulars of Lights Recently Established.

(Continued from page 448.)

Name.	Place.	Position.	F. or R.	Ht. in Ft.	Dist seen Mls	[Remarks, etc. Bearings Magnetic.]
70. Ancona	North Mole	164 yds. from old red Lt.	F.	33	9	Altered 1st July, 1868. Green. Has a bell buoy 180 yards N.W. vessels to pass west of it.
Ditto	South Mole	Entrance	F.	33	9	Ditto. Natural colour.
Ditto former	Fort	Old red	F.	...	...	When Green light in bad weather cannot be seen, give it a berth of 2 cables.
Brindisi Harbour	Little Mole	S.E. side of Zuti	...	...	...	A Green Light.
71. Middle Island	New Zealand	See notice	...	...	...	See Note No. 71.
Hokitika R.	Ditto	Entrance	...	...	...	Red light changed to light of Natural colour.
Adelaide Port	Australia	S. side of outer bar	F.	50	14	To be established December, 1868, when light at entrance of creek will be done away.
72. Is. Caprara	Tremiti Is.	East End	F.	118	17	Est. 25th July. See Note 72.
73. Slesvig Holstein	Eider Mouth	Light Vessel	...	...	...	Est. 1868. See Note 73 *a*.
Eider Light V.	Position	changed	...	...	...	See Note 73 *b*.
74. Agger Chan. Kobber G.	blocked up	... ...	...	...	...	Tyboron channel now used. See Note 74 *a*.
75. Carentan Channel	Sea Bank	42° 20·6′ N. 1° 11·1′ W.	F.	16	7	Est. 1st Aug. 1868, Lower Lt. Red. } 940 yds. apart S.W. ½ W.
	Brevant	... ...	F.	49	7	Up. Lt. White }
Caudebeg	Seine river bank	49° 31·3′ N. 0° 45·1′ E.	F.	20	6	Est. 1st August, 1868. Moved further up the Seine.
Portrieux	Bay of St. Briena	48° 38·8′ N. 2° 49·5′ W.	F.	34	7	Red light.
Jean de Luz	... ...	43° 20·3′ N. 2° 0·3′ W.	F.	18	1	Est. 15th August, 1868. Red light.
76. Cape Falcon	Algeria	35° 46·9′ N. 0° 48·8′ W.	R.	340	25	Ditto. Revolution every half minute.
Mers el Kobir	Changed to	... ...	F.	...	...	Formerly Revolving.
Nemours Bay	Algeria	35° 7′ N. 1° 50·7′ W.	F.	305	8	Est. 1st August, 1868.
Poti	Outer beacon	Black Sea	F.	17	...	Red on outer beacon.
77. Roches Douvres	France W. C.	49° 6.5′ N. 2° 48·9′ W.	Fl.	60	25	Further notice to be given. *Roches Douvres.*
Astan Rock	Off Ilede Bas	Beacon	...	...	...	Beacon of Masonry.
Quiberon Bay	... ...	Rocks	...	...	...	See Notice 77.
78. Panay Island	East Coast	Rocks off	...	...	...	See Notice 78.
79. Bombay Har.	... ...	... ...	...	...	...	Fairway Buoy removed.
80. Lorenzo Channel	G. California	... ...	...	...	...	See Notice No. 80.

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

No. 71.—*Sunken rock between Cape Foulwind and River Buller.*—Commander H. L. Percival, H.M.S. *Falcon*, states that a sunken rock (now called the *Falcon* rock), having 2 or 3 feet over it at low water, lies midway between the north extreme of the Three Steeples (off Cape Foulwind) and the entrance of the river Buller.

No. 72.—The light is visible through an arc 258½°, or from between the bearings S.E. by E. ¾ E., easterly (S. 65½° E.) round by south and west to N. by E. ¾ E. (N. 13° E.) Also through an arc of 3½° in the direction of the anchorage and channel formed by the islands of St. Niccola, Cretaccio, and St. Domino.

The illuminating apparatus is dioptric or by lenses, of the fourth order.

The tower is octagonal in shape, white, and attached to the keeper's dwelling, which is coloured yellow.

All Bearings are Magnetic. Variation 12° *Westerly in* 1868.

No. 73*a*.—*Light vessel off the mouth of the Eider river.*—With reference to Notice to Mariners, No. 27, dated 21st March, 1868, respecting a light vessel then about to be stationed westward of the mouth of the Eider river;

The Prussian Government has given further Notice, that the light vessel has been placed in position, and the light exhibited.

The light vessel is moored in 7 fathoms water, with the following bearings, viz.:

Outer Elbe light vessel	S. by W. ½ W.
Eider light and Pilot vessel	E. by S. ¾ S.
South Hever beacon buoy	E. by N. ¾ N.
Helgoland lighthouse	W. ¼ S.,

and her position is in lat. 54° 15′ 50″ N., long. 8° 17′ 30″ East from Greenwich.

The light vessel is painted black, with the name *Eider* in white on each side, and has three masts with a black ball at each mast head.

In misty or foggy weather a bell will be sounded, and ships approaching the Eider shoals on a wrong course will be warned by signal guns.

The light vessel will remain in both summer and winter, and will only be removed when forced to do so by floating ice; if under these circumstances the vessel is not in position, the light will not be exhibited, and a black flag with a white square will be hoisted at the mizen.

No. 73*b*.—*The Eider light and Pilot vessel at the mouth of the Eider river.*—Also, that the position of the light and pilot vessel at the mouth of the Eider river has been altered.

She now lies in 3½ fathoms, with the following bearings, viz.:

St. Peter's Church	E.N.E.
Blanort beacon	S.S.E. ½ E.,

and her position is in lat. 54° 15′ 37″ N., long. 8° 32′ 44″ E.

The above light vessels and the beacon buoy laid down between them are in a line, bearing E. by S. $\frac{3}{4}$ S. and W. by N. $\frac{3}{4}$ N.

All Bearings are Magnetic. Variation 17° *Westerly in* 1868.

No. 74*a*.—NORTH SEA—JUTLAND.—*New Channel to Limfiord.*—The Agger channel into Limfiord has become unnavigable, but a new channel nearly one and a quarter miles further to the south of it, called *Tyboron*, has been formed; this channel has from 6½ to 7 feet in it at high water.

In consequence of the above alteration, the Pilot vessel hitherto stationed off the Agger channel has been moved, and anchored off the new channel, in lat. 56° 42′ 42″ N., long. 8° 3′ 39″ East from Greenwich.

No. 74*b*. KATTEGAT.—*Alteration in position of the Kobber Ground light vessel.*—The Danish Government has given Notice that the Kobber Ground light vessel has been moved one and a half miles in a N.E. by E. direction; she now lies in 10 fathoms water, and her position is in lat. 57° 8′ 52″ N., long. 11° 22′ 46″ East from Greenwich.

The Bearing is Magnetic. Variation 15° *Westerly in* 1868.

No. 77.—*Sunken rocks in Quiberon Bay.*—The following sunken rocks have been recently discovered in Quiberon bay:—

1st. Roche de la Souris. This rock has 25 feet on it at low water with 33 to 36 feet around. It lies S.S.W. $\frac{2}{10}$ miles from Kerbeann point, and is near the anchorage for vessels in the bay.

2nd. Roche Karek-Pellan has 2 feet water on it at low water; it lies 600 yards S.E. from the Roche de la Sauris.

3rd. Basse Révision. This rock is nearly awash at low water, and from Les Beufs rock bears West distant 580 yards.

4th. La Roche Kercoriédo is a small rock 720 yards S.S.W. from Petit Mount.

All Bearings are Magnetic. Variation 21° *Westerly in* 1868.

No. 78.—The Spanish Government has given Notice, that two sunken rocks have been recently discovered off the east coast of Panay Island.

One rock has 9 feet water on it and lies with the following bearings, viz.:

Eastern extreme of Malangabau ..... S.S.W. $\frac{1}{4}$ W.
Hill of Pan de Azucar Island ..... S.W. $\frac{3}{4}$ W.

Position, lat. 11° 21′ 40″ N., long. 123°.10½′ East from Greenwich.

The other rock lies N.E. 1¼ miles from the above with 12 feet water on it: between the two are 18 fathoms.

No. 80.—The rocky patch discovered by H.M.S. *Scout*, with from 9 to 12 feet water, named *Scout shoal*, lies 1¼ miles from the south-east shore of the channel, with the following bearings, viz.:

The centre of a gap next South of the highest peaks of Ceralbo island E. by S. East extreme of Espirito Santo N. $\frac{1}{4}$ E. North rock (breakers) N. $\frac{1}{2}$ E. The highest land on the Californian shore just open N. E. of a peculiar red mound on Dispensa point, the southern end of Espirito Santo.

These bearings place it W. ¾ S., 1¼ miles from Arranco Cabello point, and N. ⅛ W., 1½ miles from San Lorenzo point.

Discoloured water extends some distance to the northward of the patch, but not less than 6½ fathoms could be found.

All Bearings are Magnetic. Variation 10° *Easterly in* 1868.

Notes of Novelties.

Overloading Merchant Ships.

In reply to Mr. Weguelin,

Mr. Cave stated that the Board of Trade had no power to issue regulations to prevent the overloading of merchant vessels, and too much legislation on such a subject might tend to diminish the responsibility at present attaching to an owner who allowed his vessel to go to sea in such a condition. (Hear, hear.)

Did the member for Wolverhampton put this question to test the *paternal character* of the Government in its care of merchant shipping, or in reference to the "responsibility" attaching to the owner of the *London*, which was stated to have gone to sea in an overloaded condition? losing, as all the world knows, somewhere about 150 souls! Responsibility! Where is it?

Important to Mariners.—(We preserve this to overhaul in our next.)—Captain E. Wood, in command of the schooner *Prince*, reports having run into the breakers, May 12, in long. 166° 55′ west, and lat. 56° 25′ north, in a gale of wind from the south-west, barometer marking 28 and six-tenths. The shoal runs north-west and south-east, and gave eight fathoms water where Captain Wood sounded close to the south end of the breakers. Captain Thomas Long, when in command of the brig *Zoe*, reported the north end of the shoal in 57° 15′ north, and about north-west from Captain Wood's position. The shoal is laid down on some Russian charts, but on no others to Captain Wood's or Long's knowledge, and they both consider the shoal dangerous.

Gibraltar and its Sensationals.—On the subject of the examination of our trading craft that appear to have been lately rather rudely handled by Spanish authorities, we quite agree in the following remarks of the *Daily News*.

"We must always be a little on our guard against the stories that so often reach England from Gibraltar of insults and outrages committed against British vessels by Spanish revenue cruisers. Gibraltar is the headquarters of an incessant and indefatigable smuggling trade, and one result of the enterprising operations of this free port is a smouldering chronic hostility between the Spanish Customs authorities and

every vessel bearing British colours, and hailing or appearing to hail from the "Rock." The Rock itself, as a British fortress, may be supposed to be a perpetual eyesore to Spaniards. Yet, as a matter of fact, the relations between the British Governor of Gibraltar and his Spanish neighbour at Algesiras have almost always been perfectly friendly and cordial. And "the Rock" has often served as a welcome refuge in time of trouble to Spanish patriots out of favour with the Government at Madrid. There must be many Spanish Liberals who would be as sorry to see Gibraltar restored to Spain as many French Liberals would be to see Belgium annexed to France. Spaniards who can rise above a narrow patriotism to higher views of the interests of a liberal political civilization in Europe, are capable of appreciating the advantage of secluding that promontory of the Peninsula which guards the gates of the Atlantic from the grasp of a sullen and disordered despotism, and entrusting it for some time to come to the guardianship of freedom.

That the circumstances and conditions of British tenure of the Rock do, however, create many difficulties for both Governments cannot be denied. It would be unjust to charge the authorities at Madrid with the responsibility of every petty act of insolence perpetrated by a *guarda costa*. What the British Government has a right to complain of is the conduct of the Spanish Customs and naval authorities at the ports from which these revenue cruisers sail. Evidently there must be extraordinary laxity and remissness on the part of these authorities if we are to acquit them of complicity in the lawless and offensive acts of the vessels which sail under their orders. It may be that, now and then, here and there, the British merchantman is to blame; he is certainly not impeccable, especially in those particular waters. If there were at Madrid a government worthy of a noble country and a great people, it would surely not be difficult for so discreet and considerate a Foreign Minister as Lord Stanley to come to some definite and distinct understanding with the Spanish Government for the prevention of these slight but irritating misunderstandings. England has done Spain some service, and she knows it; but a proud nation does not resent obligations by petty insults. We entirely acquit the Spanish people of any part in these foolish offences, and we desire nothing more or worse for them than a Government which shall have dignity and decency enough to do its duty towards its neighbours."

EXPEDITION TO CROSS THE ARCTIC SEA.—We have found, somewhere, the annexed, which it is said will be at the Sandwich islands in January next. There can be no doubt that whoever may be the first to cross the Arctic Ocean from Behring Strait to Spitzbergen, whether French, British, or Yankee, will be celebrated as the leading hero of the nineteenth century.

PARIS, Feb. 24.—The French have been stirred up to compete with their Anglo-Saxon cousins in the task of Arctic exploration. Up to this time Bellot—whose heroic devotion in the search after Franklin won him the admiring gratitude of all England—is the only Frenchman who figures on the long roll of Arctic explorers. Gustave Lambert,

however, just returned from an expedition to Behring Straits, has become fired with an enthusiastic desire to plant the banner of France on the North Pole, and he is now trying to awaken the public interest on the subject. An imposing Committee of Patronage has been formed, comprising eminent names in science, politics, and finance; subscription lists have been opened at the Bureau of the Geographical Society and elsewhere; and Lambert has published a most interesting little pamphlet, which explains the objects to be gained by the discovery of the Polar Sea, and the method by which these objects may be attained; and describing a new route devised by himself for arriving at the pole.

The French project, proposed by Lambert, designs to enter Behring Straits in July, then sail to the west, past Cape Judge and Cape Cook; to cut the way through the floating ice fields, when necessary by blasting or sawing; to reach Polynia, the open sea recognized by Hendenstrom in 1810, and by Wrangel and Anjou in 1825; from this point finally to sail straight to the pole, which, on the supposition of an open sea, would be easily done in summer. This route has never been attempted except by Capt. Cook, who unfortunately deemed it necessary to interrupt his voyage on account of the fogs and winds of September, and to return to winter at the Sandwich Islands. That fatal winter he was killed by the Kanakas, and this circumstance alone, according to Lambert, prevented him from reaching the North Pole, although his object was only to explore the coast of Siberia.

The only objection that can be made to the Behring Straits route is the necessity for taking the long preliminary voyage around Cape Horn.

This voyage, however, presents no difficulty, only occupies four months, can be broken by stopping at the Sandwich Islands, and gives an opportunity for testing the soundness of the vessel, sufficiency of appointments, and worth of the men. The expedition, setting out from France in February, should arrive in July at the entrance of the Polynia Sea, and in August be at the North Pole.

The vessels are to be thoroughly protected against the shocks of floating ice by a double prow and plankings of wood covered with iron; the interior is to be divided into water-tight compartments; the machinery will be of low power, in order to economize the coal, and should this give out its place may be supplied by whale blubber. Finally energetic means are to be provided for crushing and sawing the barrier of ice which separates Behring Straits form the Polynia Sea.

The crew will be composed of fifty volunteers, among whom are many old whalers, intrepid seamen, accustomed to the glaciers, and consummate navigators. The scientific corps will be selected from among the numerous persons who have already proffered their services.

THE PACIFIC RAILROAD.—*Elevations and Distances.*—The following table shows the distances between and the elevation above the level of the sea of the principal points on the Pacific Railroad, from Omaha to San Francisco:—

From Chicago to Omaha is 492 miles by the Chicago and N.W. Railway.

	Distance in miles.	Above sea level feet.
Initial point on Missouri River, Omaha	—	965
One hundredth meridian	247	2,504
Base Rocky Mountains	517	6,019
Summit Evans' Pass	548	8,242
Laramie River	578	7,175
Summit Rattlesnake Pass	618	7,560
North Platte	667	6,695
Bridger's Pass	690	7,534
Green River	820	6,092
Reed's Summit	910	7,556
Salt Lake City	1,035	4,286
Cedar Mountains	—	4,604
American Desert	1,161	4,480
Humboldt Mountains	—	6,125
Humboldt City	1,243	5,220
Truckee River	1,525	—
Nevada and California State Line	1,560	—
Summit Sierras	1,620	7,042
Western Base of Nevada Mountains	1,709	—
Sacramento City	1,716	(tidewater)
San Jose	1,836	,,
San Francisco	1,890	,,
Omaha via Union Pacific to Railroad and Branch to Denver	630	5,303

THE *Hiogo Herald* gives the following account of an occurrence which had taken place at Osaka, and which betokened a better feeling towards foreigners than has always been displayed in Japan:

On Friday last, the 17th of May, three gentlemen were going through the town of Oskar in the direction of the castle, and unwittingly passed through that part of the city which is virtually pronounced as dangerous during the Mikado's visit. Here they met a procession of some 150 two-sworded men, retainers of the Daimio of Kuriyama. Two of these gentlemen had moved to the left to make way, and had gone some distance down the street before they became aware that their companion was separated from them; he it appears was standing in the middle of the street and on turning to follow the others, found himself face to face with the leading files of the procession which halted immediately in obedience to a whistle that had an ominous sound to the two foreigners, who were anxiously awaiting their friend. Two officers then stepped out of the ranks and, with polite gesture, conducted the gentleman right round to the rear of the procession, placed him safe in the hands of his companions, and parted from them with a bow.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

OCTOBER, 1868.

Another Glance in a Mirror at Ourselves and our Nautical Institutions.

It is somewhat surprising that the old English poets, belonging, as they did, to a maritime country, never were pleased to acknowledge the beauties of the ocean. Shakspeare himself only speaks of it as no friend, although a means of national defence; and generally speaking he could see nothing but the uncertainty of the phenomena that trouble its surface. Thus, in describing the character of Hamlet, he uses the well known adage, "Changeable as the sea, or the wind;" he is satisfied, however, with the comparison where the ancients could imagine nothing but the wild freaks of nature. It was left, however, for the science of these later days to unfold the mysteries of nature. The navigator, who has fathomed its depths, the meteorologist, who has charted the wind and unravelled the secrets of the storm, has contributed largely to dissipate error and superstition. We may be less moved by its terrors, but we are, nevertheless, greater admirers of its wonders. Byron, who lived at a time when man's audacity was increased by the knowledge of those laws which govern the universe, was less moved by the furious wave than by the great harmonies of the ocean. He was one of the first to celebrate the triumph of science over this rude element of creation. What would he have said if he had lived to see iron ships on its surface. They fear it not; rather, we may observe, it yields to them and flies in foam before the irresistible masses. Navigators thus not only contribute to facilitate commerce, but they add to the confidence with which mankind strives to overcome the obstacles of nature.

There are certain institutions connected with the maritime power of England that deserve consideration.

The Royal Exchange, of London, has two fronts:—the principal one directed to the west, and the other, of more modest pretensions, looking eastward. Entering it, by this latter, the visitor finds himself in a little court open for the sake of light and air, for it is the most massive part of the building. On the right of this court is seen the entrance to that establishment known by the name of Lloyd's Office. A folding, swinging door, with large glass windows, admits him to a stone staircase, the structure of which would command the admiration of anyone, but the height of which has a civil growl from the impatient attendants of that office for the sake of business. It was my good fortune to be introduced, by the Secretary, to the mysteries of this temple dedicated to the business of navigation and commerce. The entrance is embellished with marble statues, one of which is evidently that of William Huskisson, a statesman who has left a name much venerated in the city. A marble tablet, secured to the wall, bears a long inscription, dated 1841. It is a monument, or rather, as the English call it, a memorial, placed there by the Company of Underwriters, in honour of the *Times*.* Passing a small, narrow passage, in which is the porter, with his red robes and gold lace, the visitor finds himself in a large room, to which a goodly number of merchants daily resort, to receive their despatches, and to learn the news from the wide, wide sea!

There is a matter which certain writers appear to have made a great mistake about, and which is, that the business of the merchant is one of tranquillity and ease. How they have deceived themselves. How well Shakspeare, himself born among a nation of merchants, has conceived the feelings of those who have large maritime speculations. How truthfully, in the "Merchant of Venice," he has represented the man whose property is on the ocean, and whose mind is tossed about as that is by its waves, and who gathers a flowery weed and throws it up to see which way the wind blows, and who, even on Sunday, cannot see in the edifice to which he resorts for prayer, aught but rocks on which the vessel carrying his silks and spices must inevitably be wrecked. And yet, commerce at that time was but in its infancy. In fact, the anxieties of the merchant extend in proportion as his merchandise covers the face of the globe. The English merchant above all, who has so much to do with the ocean, how can he even sleep quietly? However little, in course of the nights, the S.W. gales may blow, what must disturb his dreams the most is the ruin of his fortune. He may imagine the safety of his ship far away, in which he has hazarded a large amount of his property. He goes to Lloyd's for

* The *Times* had shewn up a coalition party, which would have ruined their bank, by means of false letters of credit, and severely injured the interests of commerce. This courageous act exposed it to a process on the part of those who were denounced for the fraud. For this, the *Times* was condemned to pay one shilling for damages, and the law expenses. Lloyd's proposed to reimburse those heavy expenses, and got up a subscription. [The *Times* declined the offer, and the sum of one hundred and fifty guineas was devoted to perpetuate, in this manner, the remembrance of the disinterested, noble conduct of the journal.]

news, where it has its head-quarters, without shewing either in his actions or manner any apprehension of ill-fortune, for his is the art of assuming the mask of indifference, under which lies, perhaps, causes for heavy disquietude. He puts a thousand questions to himself; What says the electric telegraph? What ships have touched at foreign ports? Again, what are the names of those arrived in the English ports from abroad? Here, at this same Lloyd's, he finds answers to these questions exhibited on the walls of the office. There, also, lists and papers which contain the maritime news of the day. But this is the critical moment: this person, whose fortune is on the waves, has not yet consulted the book of losses; or which is known by the name of the "Black book!"

This important volume lies by itself on a high desk, ready to be consulted by each in his turn. It is written in a legible form, and records from day to day the losses of which the news have been received. No doubt the number of these sad events varies with the seasons of the year. In the calms of summer weather one or two pages are sufficient to contain these accounts; but in the winter, and in boisterous weather a dozen pages may not contain those only, accounts of which have been received from the electric telegraph during the night. The concise style of their announcement contributes perhaps to their terrible eloquence: the name of the unfortunate vessel, that of her destination, the nature of her cargo, the coast on which she was lost, is perhaps the all that is known of her; laconic, but true; the notice might merely say she was seen to founder: but under each of their heads of information what is found but sad news! How many lives were lost, a kind of information of which this book contains less than any other. Above all, it says most about the untrustworthiness of the sea: who was the insurer, and who is the loser? These are the questions. And hence it is easy to understand with what a trembling hand certain speculators turn over its pages after a storm.

One naturally enquires why Lloyd's possess, before anyone else, this maritime intelligence? And the answer is, that this establishment has its agents in all parts of the world, in every port of the ocean and the Mediterranean. These agents are rich merchants, or perhaps consuls, whose position enables them to know every thing that happens to vessels in their part of the world, and who, as soon as they receive the intelligence, send it off in their despatches. About three years ago, when I landed on that nest of rocks in the ocean called Scilly, a circumstance reminded me of London. This was the word "Lloyd's," which appeared in metal characters (I think copper), on the door of one of not the poorest houses of the place. I might go much further among islands even more wild and uninhabited than these, provided there was a village among them and a port, and I should still find an agent of Lloyd's. And hence it is not difficult to understand the definition of this society that was given to me by a city merchant. "Lloyd's," said he, "is a large web, or kind of net which covers every sea, and the wrecks are the dead flies caught in it." The establishment furnishes

the daily papers with information concerning navigation. Besides, it publishes a daily sheet, well known by the name of Lloyd's List.

This maritime gazette is very ancient, for there is one there with the date of 7th June, 1745, when Lloyd's was no more than a coffee-house, in which merchants assembled. But as the list was then only published weekly, there is good reason for believing that the company was formed eighteen years previously, or about 1727. To anyone, who is not connected with maritime affairs, Lloyd's List has but little interest. As its name would imply, it is a list of vessels which have arrived at the ports of the ocean, and Mediterranean, but most important to anyone whose property is afloat at the mercy of the waves. Some few words picked up at sea, from good authority, and contained perhaps in three or four lines, are sufficient to place the owner on his guard. A vessel is reported, for instance, to have encountered fields of ice off Cape Horn. These white phantoms, which threaten the safety of ships at sea, seldom fail to haunt the mind of the merchant. Such notices, moreover, produce an effect on the market, always when a question of insurance arises on a vessel destined to cross the part in question. Hence the English adage may possibly come from such intelligence, that "coming events cast their shadows before them."

Maritime insurance forms, of course, the principal business of Lloyd's. The custom of insuring vessels by combination of parties against the perils of the sea and the storm evidently dates from a very remote period. Scarcely had navigation become extensively established, when people interested in the trade of the mercantile marine saw the desirability of combination to divide the losses, or to spread them and the risks among many, in short, to associate together for the purpose of averting the uncertainty of the sea. There do not appear to be any valid documents on the origin of maritime insurance in England, but it is known for a certainty that such practices were originally carried on at the old Lloyd's Coffee House. This kind of business gradually estranges itself from other accessory branches, and when the meeting of merchants of the city quitted its primitive place, they assumed a decided character of protection against the dangers which threatened their ships, as well as the merchandise sent afloat on the inconstant wave. And although it may be asserted that Lloyd's is not at all what is said of it, a company of maritime insurance. If Lloyd's is not so, what is it? It is a fraternity of merchants, amateurs, bankers, and other capitalists combined to develop navigation and commerce; but more than all, to protect property afloat from the dangers of the sea. The English make a great distinction between a society and an association: one insists on the autonomy of its members, while the other leaves to every one the power of acting as he pleases, and this latter plan is mostly preferred by them. The character of such societies is at all events unity of action. Founded mostly by leaders who divide the benefits among themselves, they represent a collection of common interests confided to the hands of a director or responsible agent.

Nothing of this is to be found at Lloyd's. Here, men who are

assembled in the same room have nothing to do with each other, as if they were all of the same interest; they conduct each their own business, and on their own risk and peril. Each one is only influenced by his own views, merely consults his own interest, and looks on the amount of his own capital according to the extent of business which he undertakes. Lloyd's thus rests on the principle to which our neighbours attribute the grandeur and prosperity of commerce, that is individuality in union. The city merchant on no account desires a protection which would impose on him a sacrifice of the power of acting for himself. Every one depending on his own resources can always reckon on them. Let anyone who would judge of this system for himself, which, without the leave or any guarantee of the State, has raised so high among our neighbours the mechanism of maritime insurance; let him, we say, enter the spacious apartment which is known as the Underwriters' Room. No doubt the word underwriter means the person who signs his name at the foot of what he writes, but it is a term which specially applies to those who insure.

What confusion is here, and running to and fro. One might almost say, that the sea, which is uppermost in the mind of every one here, has communicated its motion and its squalls to this world of its business. The perpetual flow of new intelligence, transactions of business, and conversations keeping in perpetual movement from one end of the room to the other, is marked by a low, rumbling noise. This room is well finished. The ceiling richly ornamented, is supported by two ranges of columns of Scagliola marble. At regular distances the arms of Lloyd's are emblazoned on shields. A golden anchor on a blue field shewing themselves from the cornice. Mahogany tables seen in tolerably close company, throughout the room, which is a hundred feet long, the walls surrounded by seats, form the desks for underwriters or their clerks. The persons who are perpetually coming to and going from this room are composed of very different people. First, the underwriters, whose business it is to insure shipping, and then the insurance brokers. On principle, anyone may go to Lloyd's and treat in person with the underwriters, but it is very seldom that business is done after this fashion. For instance, a merchant is desirous of insuring a certain quantity of merchandise which he is sending abroad: it is not any one whom he may first meet in the room who treats with business of this kind. Who is he then to address in a crowd of persons moving about with the transaction of business? While he is looking about for an underwriter his goods, which he wants to insure, may have found their way to the bottom of the sea. The merchant, then, would expedite his business by applying to a person who, thoroughly conversant with the affairs of the place, can save him a vast deal of trouble, with the help of his commission. The broker, who is the link between insurer and the person insured, is the person who, by the very nature of his services, inspires life into the market. He is everywhere at the same time, in treaty with every-one, and, like those birds whose cry seems to raise the waves of the sea, he is active to inspire the rest with activity. I have often wished to

know how much a year the insurances at Lloyd's amount to, but it was a piece of information not possible to be obtained.

All these being personal transactions, do not appear on any books of the establishment. But the Secretary is of opinion that even millions are annually expended in these ever recurring contracts, and when they speak of millions, the English generally mean pounds sterling.

The underwriter's business, however, is not always of a very flourishing rose colour. No doubt he is rich, and perhaps is more a gainer than a loser all his life-time. But what heavy clouds of adverse fortune occasionally rise before him in reference to his enterprises. We must not forget that the sea is his resource, even against an unlucky day. He cannot control risk, and can only regulate it by prudent calculation; and perhaps he has neglected nothing to raise his conclusions to the level of a science. The age of the ship and the character of her build, the kind of merchandise that forms her cargo, the part of the world to which she is bound, the experience and general character of her commander, are, of course, among the considerations which a clever underwriter takes into his account. The character of the weather which she is likely to encounter is not forgotten by him. Hence the people of Lloyd's take care to have before them the finest meteorological instruments. A self-registering barometer anemometer, the latter being Ossler's, are continually before them. In stormy weather the wall of their room displays, with an invisible hand, as at Belshazzar's feast, the mysterious characters which point to the ruin of their hopes. However, it may be these gentlemen, whose fortunes are at the mercy of the winds, are not likely to disregard the movements of the wind-vane, those very indications from which they derive their conclusions. Nevertheless, as meteorology is a science in which no great advance has yet been made, underwriters look to other sources of instruction. Even in the present state of our knowledge of this subject they may endeavour to ascertain by laws more or less certain the course of storms on distant seas. The great art is to say by the weather at London the kind of weather which prevails on those seas where their ships are pursuing their course, that they have insured. Although in this respect underwriters should be philosophers on the weather, their science does not appear to be making much progress; and yet I shall not be very much surprised if their speculations should one day bring out a secret from the hidden laws of atmospheric changes among the heaps of meteorologic observations already collected.

Reverting, however, to the subject before us, maritime insurances appear to be divided into two kinds. One is regular and methodical, founded on the simple calculation of probabilities commonly adopted: the others, on certain contingencies which require for their accomplishment the concurrence of certain mysterious conditions. It may occur, for instance, that a ship has not made her appearance in a port at a given time for her arrival, other ships having run over the same course without having seen her: what then has become of her?

No doubt there is ground for disquietude about her, but, on the other hand, there is nothing to shew that she has been wrecked. Hence this vessel, of which there are no news, may become the subject of fresh transactions. No doubt there are many individuals with sufficient hardihood to risk considerable sums on such a vessel, in the hope of gaining greater if this vessel should be lost, and never more heard of. In such conditions, insurance becomes a lottery; a chance, under the shadow of a name, the vessel concerning which may be at the bottom of the sea. Some years ago there was a vessel called the *President*, which afforded a remarkable instance of this kind of insurance. For some weeks there were the most serious apprehensions for her safety, up to the last moment, that is, up to the time when all hopes of her safety were at an end at Lloyd's, she was still afloat, under all sail, on the sea of speculation, known to those gentlemen who are accustomed to it. Having a good name, the risks of the underwriters were insured, who unfortunately risked nothing. Similar cases turn up every day, and large sums change hands in this game of chance, which the uncertain sea affords.

Still one must not confound evil with good, and judge the whole tree by a rotten branch. There can be no doubt that the system of marine insurance renders a service to commerce and navigation; that is acknowledged by all the world. Who is the happy individual that can successfully strive always against the storm? If the spirit of enterprise in commercial adventure were left to itself it would have been abandoned long ago, as a field of ruin and desolation. But supported by the association of wealth, and the division of risk, it can, on the contrary, brave the violence of the elements, and even contend for safety with chance! Hence every vessel and every cargo that is sent to sea are previously insured perhaps for but a small sum, or perhaps, on the contrary, according to the value of both ship and cargo, a very large one. Thus, like all companies of capitalists, Lloyd's has its celebrities. One of these gentlemen, who had attracted much attention of late years, by the hardihood and extent of his insurances of shipping, Mr. R. Thornton, a City merchant, died a year or two ago, leaving, it is said, a fortune of three millions seven hundred thousand pounds. He was born in 1776, commenced his commercial career about the end of last century, when Great Britain was shut out from the European markets, and, with his brother, determined to take his chance in breaking the blockade of continental ports. A division of the French army, under General Rapp, closed the port of Dantzic at that time, against the English merchant; and even all the ports of Northern Germany were closely guarded. But the conditions had no effect of intimidating these two merchants of London. They were determined to break the blockade. Richard Thornton, on entering the Baltic with one of his ships, was met by a Danish man-of-war, and ordered to strike his colours. The order was received by the English merchant ship with a discharge of artillery, which was kept up with so much determination that the agent of French policy, the Danish craft, was glad to make off.

In 1810 the Admiralty was in want of hemp for the sails and cordage of the fleet, and St. Petersburgh was the only place where this material could be obtained in large quantities, but all English merchants, at that time, were Sauvés, or had been driven from the Russian capital. Thornton, at his own risk, undertook to obtain it. He landed at Memel, and, in spite of difficulties, contrived to send home to England, by sea, many millions of packages of hemp, to renew the sails of the fleet, and one may easily suppose he was handsomely rewarded for his pains. Again, certain significant signs foreshadowed the decline of Napoleon's empire; they were enough for the penetrating mind of the obscure city merchant. He was the first, in 1812, to know of the defeat of Napoleon's army at Moscow: the news came to him by his brother, who was in Russia, and he was in possession of it for three days before the ministers or English merchants knew anything about it. Of course he profited by it, and thus gained about two hundred thousand pounds! As soon as the navigation of the ocean was re-established, in 1815, Thornton looked out for a new field of employment of his fortune, and in about 1830 his attention was directed to the shores of the Peninsula. Judging that the reign of Don Miguel in Portugal was in a tottering condition, and that the enterprise of the Carlists would not succeed in Spain, he thought he could make a good business by subscribing (which is the commercial term), or insuring these two dynasties. He therefore advanced considerable sums in storing up warlike materials at the Azores, and when Don Pedro's army took the field, he undertook to pay, equip, and provision the men. It is very well known how this war terminated, happily for Richard Thornton, and for the daughter of Don Pedro, in 1834. Scarcely had he settled the affairs of Portugal, when he had to defend the fortunes of a young prince against another pretender. It is pretty well known that Thornton was then the creditor of Spain to the amount of two millions sterling.

This merchant, who made queens, had been a member of Lloyd's Association of Underwriters since 1798. He was looked on as the lion of the place, and certainly, like that noble animal, confident of his strength, he disdained certain precautions that were adopted by his companions, and had a generous manner of conducting business. While other insurers divided the responsibility of risks between themselves, so that in case of the loss of a vessel she would involve many instead of one; Richard Thornton, on the contrary, accepted every thing, risks, in fact, that would try the fortune of a king. The Secretary of Lloyd's once told me that, with the utmost easiness, one day he took a risk that amounted to £200,000, all managed on a single sheet of paper. Before the last war between England and Russia, he took the entire insurance of a steam vessel, built in England for the Russian Government. One day, a friend remarking on the boldness of the risk with a foreign power: "Oh!" observed Thornton, "if they lose the ship of war which I have just insured, I have paper in my desk sufficient to pay them with their own bills."

Although this city merchant was a solitary instance of his class, one

may form from him a good idea of the resources of some of the English merchants, and their influence in the world. There is not one of these merchant princes who is not more or less responsible for large sums insured, and what an amount of importance they must impart to the Association! The punctuality with which underwriters keep their engagements is proverbial. Scarcely does the proof of the loss by wreck of a ship arrive, than the insured is informed that matters are *all right*, and in a month or so he receives his money. That assurance is as good as a bill of exchange, or a cheque on the bank. Confidence and certainty is the life and soul of these transactions, and thus it is easy to perceive that Lloyd's must be the focus of all maritime insurance. Large flourishing companies attach themselves to this main trunk, the branches of which extend to all great enterprises, and protect the community from the numerous dangers of the sea.

The Underwriters' Room contains, besides, some other interesting matters. Surrounded as it is by a wainscot wall, it has a gallery which is gained by a staircase, the walls of which are lined with sea-charts, fixed on spring rollers, and preserved with considerable care: and on one side of it is a lower room, and a library of maps, most of which have been presented to the Association by different Governments of Europe. One of these large volumes is an old one presented by Louis Philippe, of course magnificently bound. The Reading Room occupies the northern part of the building, where may be seen files of papers, gazettes, etc., arranged according to the parts of the world they come from: India, China, Australia, and Canada. In fact, two large round tables may be supposed to represent the whole world, with its political divisions. With the advantage of this arrangement, the reader can at once refer to the state of the markets in all parts of the world. In fact, all the innumerable sources of information which the man of business requires for reference are found at hand in this establishment of Lloyd's. How can such an establishment sustain itself, the expenses of which amount to about ten thousand a year, that received nothing from the profits of its members? In order to reply to this question, it is necessary to look to the sources of its revenue.

(To be continued.)

THE ERUPTIONS OF MAUNA LOA*—SANDWICH ISLANDS.

(Concluded from page 497.)

A COMPANY of eight or ten, including the writer, took passage in the steamer for Kona on the 6th of April, and arrived at Kahuku on the 10th, three days after the eruption broke out. We consequently had

* A Plan of this Island will be found in our August number of last year.

the finest opportunity that could possibly have been sought, for seeing what proved to be a most brilliant display.

On the passage to Hawaii in the steamer, on the night of the 7th, the whole island of Hawaii was seen brilliantly illuminated, the overhanging clouds reflecting the glare of the fires beneath, and a stream of lava was seen from the vessel, a distance of at least one hundred miles.

We left Kealakeakua Bay on the morning of the 9th of April, and after a slow, tedious ride of twenty-seven miles, over lava clinkers, reached Kapua towards night, where we slept in a thatch house, built by Mr. Charles N. Spencer as an accommodation house, it being just half-way between the bay and Wahiohinu, and distant from the lava flow about thirteen miles. During the night we could hear the distant noise of the eruption—a peculiar rumbling, so different from the roar of the sea or any other noise, that, to wake up in the night and listen to its unaccountable utterances, tended to create fear with those who for the first time heard it. In the morning, several of the party decided to turn back to Kealakeakua, and returned without seeing the grand sight before us. The others, seven in number, not counting native attendants, mounted horses and proceeded on to the flow.

As we approached it the rumbling noise became more and more distinct, and the evidences of approach to some great disturbance of nature more frequent. The ground was covered with what appeared to be cinders, but on examining them we found they were fragments of pumice stone, which had been carried by the wind a distance of over ten miles. Mixed with these cinders was *Pele's hair*, which we found floating in the air, and when it was thick we had to hold our handkerchiefs to our nostrils to prevent inhaling it. Our clothes were frequently covered with it. On reaching an eminence five miles from the stream, we found a group of forty or fifty natives, who were waiting to cross over to Kau, and had been here several days. From this point dense clouds of smoke could be seen rising all along the course of the lava stream, from the mountain side to the sea.

We hurried on and reached the flow shortly after noon, where, from a ridge to the west of it, the whole scene opened before us. Between us and the crater was a valley five hundred yards wide and ten miles long, which had recently been overflowed throughout its entire width and length, from the mountain to the sea, where it widened to two or three miles. The lava was of the smooth *pahoehoe* variety, from ten to twenty feet deep, and partially cooled over, though flames, smoke and gas escaped from numerous crevices. We stood on it, though it was hot enough to burn the soles of our shoes. This lava stream originated some ten miles up the mountain, and came down early on the morning of the 7th. It had ceased flowing, the eruption having opened a vent lower down and further south.

Beyond this valley, about a quarter of a mile distant, was the pali of Mamalu, a steep precipice, which runs from the mountain to the south point of Hawaii, and forms the west boundary of the table land of Kahuku, a beautiful level plateau, covered with tall grass, affording

excellent pasturage for herds of cattle, horses, sheep, and goats. About a mile above the road were the farm houses of Captain Robert Brown, who lived there with his family. Near by were the dairy establishment of C. N. Spencer, and other dwellings. This plateau was several miles in extent, running as far as Waiohinu, and sloping gently off to the sea, and dotted with hillocks.

On Tuesday afternoon, April 7th, at five o'clock, a new crater, several miles lower down than that referred to, and about two miles back of Captain Brown's residence, burst out. The lava stream commenced flowing down the beautiful grass-covered plateau, towards and around the farm house, and the inmates had barely time to escape with the clothes they had on, before the houses were all surrounded, burned and covered with streams of fiery lava, varying from five to fifty feet in depth. Fortunately all the inmates escaped safely to Waiohinu, but how narrow the escape was, and how rapid the stream flowed, may be inferred from the fact that the path by which they escaped was covered with lava *ten minutes* after they passed over it.

On ascending the ridge we found the eruption in full blast. Four enormous fountains, apparently distinct from each other, and yet forming a line a mile long, north and south, were continually spouting up from the opening. These jets were blood-red and yet as fluid as water, ever varying in size, bulk, and height. Sometimes two would join together, and again the whole four would be united, making one continuous fountain a mile in length.

From the lower end of the crater a stream of very liquid, boiling lava flowed out and down the plateau, a distance of two or three miles, then following the track of the Government road, ran down the precipice at an angle of about thirty degrees, then along the foot of the pali or precipice five miles to the sea, the stream being about eight or ten miles in length, and in some places half a mile wide.

This was the magnificent scene, to see which we had hurriedly left Honolulu, and had fortunately arrived at the right moment to witness, as it opened before us in all its majestic grandeur and unrivalled beauty. At the left were those four great fountains, boiling up with most terrific fury, throwing crimson lava and enormous stones weighing a hundred tons, to a height varying constantly from 500 to 600 feet. At times these red-hot rocks completely filled the air, causing a great noise and roar, and flying in every direction, but generally towards the south. Sometimes the fountains would all subside for a few minutes, and then recommence increasing till the stones and liquid lava reached a thousand feet in height. The grandeur of this picture, ever varying like a moving panorama, painted in the richest crimson hues—no person can realize unless he has witnessed it.

From this great fountain to the sea flowed a rapid stream of red lava, rolling, rushing, and tumbling like a swollen river, and bearing along in its current large rocks that almost made the lava foam, as it dashed down the precipice and through the valley into the sea, surging and roaring throughout its length like a cataract, with a power and fury perfectly indescribable. It was nothing else than a *river of fire*,

from two hundred to eight hundred feet wide and twenty feet deep, with a speed varying from *ten to twenty-five miles an hour*. As a huge boulder floated down, we imagined what if it were the iron-clad *Stonewall*, which had just left our harbour—would she have floated on to the sea unscathed, or melted into molten lava, and vanished from sight?

Night soon came, and with it the scene became a thousand-fold more beautiful, the crimson of the fountains and the river doubly rich and brilliant, the lurid glare of the dense clouds and steam that overhung us and the roaring of the crater and cataract were fearfully grand and awe-inspiring. It was like the conflagration of all London or Paris, as the whole scene extended over a distance of ten miles. Add to this the flashes of lightning and the sharp, quick claps of thunder, and the reader can imagine that a scene was before us that well repaid us for our opportune visit. We never expect to see another so grand as this.

Dr. William Hillebrand and others have visited the crater since it ceased flowing, and find that it consists simply of *a rent or fissure* in the earth, from ten to twenty feet wide. He traced it about three miles up the mountain, but it is quite probable that it extends several miles farther on, as the mountain continues smoking in a line ten miles above. There is therefore no large crater, properly speaking, but the lava flow was confined to this rupture, which continued to open lower down, as the molten lava acted on it.

The view which we obtained of the eruption from the Kona side on the 10th of April was therefore a side view, and probably the finest and nearest that could possibly have been had. One peculiarity of this spouting was that the lava was ejected with *a rotary motion*, and as it ascended the air, both the lava and stones rotated always in one direction *towards the south*. In this respect it differed from that of 1859, which we were also among the first to witness. This rotary motion of the lava would appear to have originated below the surface, as it rolled along like waves, and corresponds with the surging sounds heard by the inhabitants of Kau during the heavy earthquake shocks.

Regarding the rapidity of the stream of lava, since reading accounts of former eruptions, in which it is claimed that the lava flowed *forty miles an hour*, we must say it is hardly possible to conceive of a stream flowing with greater rapidity than the cataract and river we witnessed April 10th. It reminded us of the Connecticut River in a spring flood, with the stream filled with ice and rushing over the rapids at an impetuous rate. The speed is more likely to have been twenty-five miles an hour than twelve. Where it ran down the precipice, at an angle of about thirty degrees, it was more narrow and rapid than lower down, where it spread out broader. This was the only stream which reached the sea, and flowed into it a little west of the south point of the island, at a place called Kailikii. It lasted only five days, the eruption ceasing entirely on the night of the 11th or morning of the 12th.

During its continuance, the atmosphere was filled with smoke so

dense that the sun appeared like a ball of fire, and the whole island was shrouded in darkness. This smoke came from the rent or crater, and was highly charged with sulphur. As it spread over the island, it carried a deadly blast to vegetation, and the leaves of the more tender plants and vegetables were withered and died. It did not kill the plants in any sections, that we could learn.

Opposite the point of coast where the lava reached the sea, a small conical island was thrown up in the sea, about a mile distant from the shore, consisting of mud and sand, and emitting steam from its summit. This island has become joined to the main land by the lava flowing from the new eruption. As the lava entered the sea, clouds of steam and smoke rose up, and flames of bluish fire were emitted rising from the water to a height of from ten to twenty feet.

During the night we were at the volcano, the air was highly charged with sulphuric gas and electricity, and frequent flashes of lightning were seen directly over the lava stream, accompanied with short claps of thunder. These flashes were also observed less frequently further up the mountain.

Two kinds of lava were erupted during the flow. It commenced with a stream of smooth, glossy lava, known here as the *pahoehoe*, which was followed by the thick, dirty kind called *aa*. Kuhuku farm was nearly covered with the latter, which branched out into four wide streams, covering a space of four miles wide and long. This was followed again by the liquid or *pahoehoe*, which ran into the sea, and continued till the eruption ceased. About 4000 acres of good pasture land were destroyed, besides which the lava ran over an immense district of worthless land.

On the night of the 6th, prior to the eruption, there was a shower of ashes and pumice stone, which came from this crater, and covered the country to the distance of ten or fifteen miles each way. Generally the ashes were not more than one or two inches in depth, but in some places were found to be fifteen. The pumice stone was very light and appears to have been carried by the wind a great distance. Pieces two and three inches in size floated ashore at Kealakekua Bay forty-five miles distant.

The roaring of the crater was a novel feature to those who had never visited an eruption before. It was caused by the rocks thrown out from the crater, and the grinding or crushing process of the *aa* as it moved along. This *aa* flow appears composed of half-melted lava, and as it is pushed along piled up sometimes fifty or even a hundred feet high; presenting the appearance of a railroad embankment, the sides having an angle of about forty degrees, down which the lava stones keep rolling. This stream generally moves along slowly, but when the quantity of liquid lava, which floats and carries along the *aa*, is abundant, it moves from one to four miles an hour. What makes the difference between the dry *aa* lava and the liquid *pahoehoe*, which flows like water, is an interesting subject of inquiry that has never been settled. They both flow from the same craters, one giving place to the other in turns. Our own opinion is that the smooth liquid variety

obtained its character by long fusion, while the *aa* variety (which appears like half melted stones and dirt mixed together), consists of the interior surface of the earth torn off and thrown out during the eruption. An examination of the various *aa* streams tends to confirm this theory.

Besides the dwelling and premises, which were completely burned and covered up ten feet deep by the lava, Mr. Brown lost about one hundred head of cattle, and other parties about one hundred and fifty head. These cattle appeared to be paralyzed on the approach of the lava, and made no effort to escape. It is difficult to estimate the loss of property in Kahuku, but it may be roughly set down to be at from ten to fifteen thousand dollars. The houses destroyed were not expensive, the main loss being in land and stock.

The lava thrown out during this eruption has been of a more porous nature than in most of the late ones. Some of the specimens we have seen are exceedingly light. The shower of brownish pumice stone, which preceded the lava flow, was also something unusual in Hawaiian eruptions, and showed the eruption to possess a new character, perhaps the existence of more than usual steam and gases in its composition. Some have wondered why the flow ceased so suddenly—continuing only five days. The cause is probably this: so soon as the steam, which has been the active agent in producing the earthquake shocks, and in raising the lava so near to the top of the summit crater that it lightened up the clouds above it, found vents, the eruption lost much of its power, and allowed the lava to rapidly subside, and the pressure by which it was thrown out gave way.

The quantity of lava erupted has not been probably one-tenth what was discharged in 1859, but the quantity of steam, gas, and smoke discharged during one week must have exceeded what escaped during ten weeks in 1859, when the volume of smoke was comparatively small. We judge so from its density over all the group and for a thousand miles off. This has not occurred in any late previous eruption to the same extent. The inference therefore may be drawn that when an unusual quantity of gases and smoke escape, a less amount of lava will be discharged; and vice versa, when the quantity of smoke is small the amount of lava is increased.

Respecting the weather during March, it may be added that it was of the same stormy character as has prevailed all over the westward hemisphere, including the North and South Pacific. The quantity of rain that has fallen on the mountains of Hawaii has also been large, but to what extent these have affected the internal fires, and produced the earthquakes and eruptions, must remain only a matter of conjecture. The thermometer during the same month showed no unusual fluctuation, ranging from 68° and 70° at sun-rise, and 83° to 84° at noon, with considerable regularity.

Dr. Hillebrand communicates to the *Gazette* an account of his visit to the crater, from which we take the following:

"As the principal interest was the discovery of the main source of the stream, we at once went to that part of it, where according to

common report, the lava had issued. A very light dark brown glistening pumice stone lay scattered about long before the lava was seen. Near the flow it increased so much that the animals' feet sank deep into it at every step. We soon reached the ridge of a hill from which we surveyed the place where, according to our guide's account, the fountain of lava had been seen. This upper portion of the lava stream fills a broad valley or depression, between two parallel low hills of not more than 300 feet high, both running almost due North and South. From the western one of these hills Mr. Whitney had witnessed the eruption. From the eastern hill we in vain looked for a crater or cone. We did not make out any indication of the character of the eruption until we had crossed nearly three-fourths of the stream, which here is not far from a mile wide. Then our attention was attracted by an accumulation of scoria. Nearing this we were struck by a current of hot air, and, a little further on, found ourselves on the brink of a deep gap in the lava about twenty feet wide, but narrowing and continuing itself northward. We walked round the southern end of the gap and followed it up on the West or lee side. Before long we came to another enlargement of the fissure like the former, emitting hot air charged with acid gases which drove us back. Still continuing our march on the West side of the fissure as close as the hot gases would allow, we came in sight of a pretty miniature cone, built up most regularly of loose scoria to the height of twelve feet, and located right over the fissure. It enclosed a chimney crater of about twelve feet in diameter, with perpendicular sides, the depth of which could not be ascertained. Hot gases issued in abundance. On account of the exhalation of the latter we were obliged to cross the chasm, on the bridge formed by the cone, to the windward side, along which we followed up steadily."

The direction of this fissure was South 6° West and North 6° East. The Doctor traced it up the mountain about three miles, when he was obliged to desist, owing to the covered fires, smoke and heat. In one place he came up to a cataract of lava coming down the precipitous side of the hill, a height of at least 300 feet.

Kilauea Crater.—During the great commotion on Hawaii, the ancient crater of Kilauea has undergone changes, a record of which will interest all who have ever visited it. The "great earthquake" occurred four p.m. on the 2nd of April, which was followed by another of nearly equal force at half-past twelve on the morning of the 4th, when the fires began to die out and the lava in all the lakes in it to subside, till on Tuesday following there was no sign of fire or smoke, showing intimate connection with the Kahuku eruption.

Prior to the 4th, it had been unusually active, and the entire western half of the crater is represented as having been in commotion—some accounts state that it was a mass of molten lava, which has not been the case since May, 1840. On the 4th, the lava began to be withdrawn, and the portion which had been in recent action subsided, so that it is now three or four hundred feet lower than it was a month before. From the volcano house one would not readily observe the

extent of the subsidence, but on going down into the part that has sunken, the extent of the change is noticed. The old south lake is now a hollow pit five hundred feet deep, with a single large cone at the bottom, surrounded with black lava rocks, but showing no fire or smoke. The result of the earthquake was to completely extinguish the fires in the crater, at least for a few days.

The following from Mr. Fornander's letter will be read with interest in this connection:

"At the crater of Kilauea the action of Thursday last was terrific. Mr. Porter (who had charge of the Volcano House), arrived in Hilo Friday afternoon, and reported that from four to half-past eleven p.m. (the time when he left), there was a continued series of heavy shocks, the earth opening and cracking in all directions. At the first heavy shock (one p.m.) the crater changed its entire appearance. The walls had tumbled in on the south and southwest sides, and on the east side from the southeast sulphur banks to nearly the place of descent from the Volcano House. The banks of the south lake, including what was known as the Cathedral, had caved in, and the lake was some six times larger than before. A large chasm had opened in the neighbourhood of the north lake near the look-out house, running up into the woods, and cutting off the Kau road entirely. Between five and six p.m., fire was discovered to have broken out in the old Kilauea crater, to the east of the volcano, and at the same time the lava beds in the volcano seemed to have settled down about 100 feet, as if the volcano had been tapped. Mr. Porter attempted to visit the old crater, but was obliged to give it up on acconnt of the chasms and cracks continually opening and barring the way. He got sufficiently near, however, to ascertain that that old crater, which for ages has been extinct, was now all aglow with burning lava, probably drawn off from the volcano. The shocks, explosions, opening of new cracks and steamholes in all directions, threatening to isolate the Volcano House, a large steam-hole right in the gravel path in front of the house, and a chasm running all along the fence nearly up to the stables, and the, so to say, visible grinding of the rocks to powder by the continued action of the earthquake, admonished Mr. Porter that it was about time to leave for Hilo, and he left."

In order to make this subject clear, it should be stated that there are three craters at Kilauea—the large one, which all travellers visit; second, "Old Kilauea," which is directly east of the large crater and connected with it by a narrow isthmus; and the third is "Kilauea iki," or little Kilauea, southeast of the large crater and connected with the farther or south sulphur banks by a similar isthmus. This latter is seldom visited, as it is on the lee side of the crater and not so accessible. The "old crater" is the one referred to. Until the late eruption it was covered with trees, dense shrubbery, and grass, and probably had not before been the scene of an active eruption for a century at least.

From the interesting account, published in the *Gazette* by Dr. Wm. Hillebrand, we extract the following relating to the crater of Kilauea:

"Allow me to relate what I learnt from Kaina, who has resided near

the volcano without interruption for the last five months, and whose strong nerves sustained him during the fearful catastrophe introduced by the earthquake of April 2nd. He and the Chinaman who keeps the house, were the only persons who remained at Kilauea. He says that for two months preceding the first shock, viz., from January 20th to March 29th, the crater had been unusually active; eight lakes being in constant ebullition, and frequent overflowing. During all this time (the date of its first appearance could not be ascertained exactly) there was in the northwest corner a "blow-hole," from which, at regular intervals, of a minute or less, with a roaring noise, large masses of vapour were thrown off, as from a steam engine. This ceased about the 17th of March. At the same time the activity of the lakes became greatly increased, and Kaina anticipated mischief. Two days later, Mr. Fornander found the bottom of the crater overflowed with fresh lava and incandescent.

"Thursday, April 2nd, at a few minutes past four p.m., the big earthquake occurred, which caused the ground around Kilauea to rock like a ship at sea. At that moment, there commenced fearful detonations in the crater, large quantities of lava were thrown up to a great height; portions of the wall tumbled in. This extraordinary commotion, accompanied with unearthly noise and ceaseless swaying of the ground, continued from that day till Sunday night, April 5th, but *from the first, the fire began to recede.* On Thursday night, it was already confined to the regular lakes; on Saturday night, it only remained in the great South lake, and on Sunday night, there was none at all; Pele had left Kilauea. The noises now became weaker, and were separated by longer intervals. By Tuesday quiet reigned in Kilauea. On that afternoon the lava burst out at a distance of forty miles, southwest, in Kahuku.

"The great South lake is transformed into a vast pit, more than 500 feet deep, the solid eastern wall projecting far over the hollow below, while the remaining sides are falling off with a sharp inclination, and consist of a confused mass of sharp *aa*. More than two-thirds of the old floor of Kilauea has caved in, and sunk from 100 to 300 feet below the level of the remaining floor. The depression embraces the whole western half, and infringes in a semicircular line on a considerable portion of the other half. It is greatest in the northern, and rather gradual and gentle in its southern portion. Entering upon the depressed floor from the southern lake, it was some time before we became fully aware of its existence. It was only on our return from the northwest corner, where it is deepest, that there presented itself through the mist in which we were enveloped, a high wall of 300 feet of grotesque and fantastic outlines. At first we were quite bewildered, fancying that we beheld the great outer wall of the crater. On nearer approach we soon satisfied ourselves that this singular wall represented the line of demarkation of a great depression in the floor of the crater —a fact that surprised us the more. as a bird's-eye view from above had altogether failed to apprise us of its existence."

The latest advices from Kilauea report that the fires are returning

to the large crater, and it is not improbable that it will soon resume its old state of varying activity.

Incidents of the Eruptions.—The Rev. S. S. Bishop, principal of the Lahainaluna Seminary, says, from an observation taken by him at Lahainaluna, that the column of smoke which rose from Mauna Loa, on Wednesday morning following the eruption, reached an altitude of seven and four-fifth miles before fanning out.

The number of shocks which occurred at Waiohinu from March 29th to April 10th, is estimated by Mr. Silloway to have been upwards of *two thousand*, there having been some days between three and four hundred. The heaviest shock occurred Thursday, April 2nd, being the same that was felt so sensibly at Honolulu. This destroyed every church and nearly every dwelling in the whole district.

From ten to twelve o'clock of that day there had been service in the large church in Waiohinu, and it was crowded with people. Only four hours after they left the heavy shock came, the walls tumbled in, and the roof fell flat—all the work of ten seconds.

At the same instant, every man, woman, and child was thrown off from their feet. Horses and cattle dropped down, as if dead. A man riding on horseback had his horse tumbled under him so suddenly that he found himself and horse lying flat on the ground before the thought of an earthquake entered his mind.

The earth opened all through the district, and in some places caused dangerous fissures, while in others it closed up again. In one place it closed twenty feet from where it opened. These fissures make it dangerous to travel in the dark. Everywhere the roads are broken up and it will take much money and labour to restore them to their old condition.

As the *Kona Packet* was passing the south point of the island, about three miles from the shore, a conical island, four hundred feet high, rose out of the sea, midway between the vessel and the land, emitting a column of steam and smoke. The lava river flows into the sea at this island and has extended the shore out to it one mile at least, so that it is now on the main land. The packet was so near when this island burst up, that the sand was spattered on the masts and sails of the vessel.

The scene at the eruption was a most melancholy one to witness. There were hundreds of fine cattle grazing around the farm houses, when the lava streams surrounded them and hemmed them in. The poor animals seemed aware of the danger, but made no effort to escape. The fiery lava drew nearer and nearer till the heat made them restless, but they would not run. They bravely looked the fiery foe in the face, stood firm till it reached them, then dropped in the stream—a sudden cloud of smoke followed and not a sign remained. Thus one after another fell till over two hundred were consumed.

A fine horse was fastened with a rope to a stake, when the lava approached and burnt the rope, when the animal, with human instinct escaped between two lava streams, and was saved to his owner.

The sufferings and alarm experienced by the residents of Kau during

the two weeks that the earthquakes and eruption continued prior to their leaving, appear to have been great. Night after night, they were compelled to sleep on the mountain ridge back of the village, exposed to the cold and damp winds and rain from the sea, subsisting on taro and fishes when they could get these, or fasting when they could not.

The whole district is in ruins, *a field of desolation*, and probably five hundred thousand dollars would not restore it to what it was months ago. It is no wonder that the foreigners are leaving the place, with the intention of never returning to it again.

The number of deaths were over one hundred. The exact number may not be known for some time, as some persons are missing whose absence may yet be accounted for. The loss of life is melancholy indeed, and the sympathy of the Hawaiian people, should be generously expressed to the mourning and bereaved families of Kau, whose tender ties have been so suddenly and keenly severed by the hand of God.

The Volcano.—From Kau we learn that every part of that district is quiet. No earthquakes are reported as having occurred during the past ten days. The old crater of Kilauea is resuming its former state of activity. The light of its fires was distinctly seen from the *Kona Packet*, while lying at Kealualu harbour last week. Verbal reports of natives arriving at Waiohinu from the crater, confirm these statements.

POLAR MAGNETISM.

(Concluded from page 477.)

LET us suppose, then, that the earth's revolution round the sun is the governing cause, the line of attraction being from the sun's centre to the centre of the earth.* It will be seen at once that in the earth's revolution round the sun, or with the sun round any other centre, her axle on which she performs her daily revolution, does not, and cannot lie in a line with the line of attraction from centre to centre, but must lie at an angle to it. And how is this? If we draw a line from the

* We make no question here of the laws of gravitation as demonstrated by Newton, or the character or degree of its force, which is always directly as the masses of the heavenly bodies, and inversely as the squares of their distances; the only question is the identity of the gravitating force with the magnetism which directs the needle to the pole, by whatever name we may designate either. It is worthy of remark here, that Mr. Barlow, in his experiments to correct the influence of iron in the ship on the compass, found that the attraction of iron on the magnet was of the same force and character as the "attraction of gravitation," although he does not appear to have observed it himself. He found that a hollow globe of thin iron had the same influence on the magnet as a solid globe of the same surface dimensions. In other words, he found the attractive force to be directly as the mass, and inversely as the square of the distance.

north pole to the south polar axle through or over the Atlantic Ocean, and parallel to the earth's axis, we find that the north magnetic pole lies west of such line at an angle to it, and the south magnetic pole lies east of such line at the same angle to it, and the result so far answers to the theory. But here we meet with difficulty; for if the earth's revolution round the sun should be the cause of polar attraction, the line of attraction being at an angle to the earth's axis, then because one body revolving about another body also in motion gains one revolution of the body around which it revolves, therefore the magnetic pole should revolve about the north pole once in every year, which it does not. Again, we have another difficulty—the earth does not revolve about the sun with either pole turned towards him; but the tropical zone is for ever turned towards the sun, and never the polar regions; and the line of polar attraction is seen to be at a wide angle to the line of the sun's attraction. Confirmatory of our theory, however, there is an inferior polarity in the Indian Ocean, north of the equator, sufficient, in passing over it, to disturb the needle; and another in the Pacific Ocean, south of the equator, the two at about the same angle to the equator, as the north and south poles to the earth's axis. These polarities may answer to the sun's attraction, and the two, that is to say, the equatorial polarities and the north and south magnetic poles, are, as I believe, travelling together in perfect unison with each other. The South Pacific polarity was, I think, discovered by Captain Cook, and has since its discovery, as laid down by him, moved some twenty or more degrees west, thus keeping pace with the north magnetic pole on this continent.

It is evident, I think, from what has been shown, that the north and south are the superior polarities, to which all others are secondary, because all others are in their influence purely local, while the influence of the north and south is paramount and universal.

We must, therefore, look to a yet higher source for the origin of that magnetic attraction which shall *cause* the revolution of the magnetic poles in the period of time in which we have seen that they do revolve.*

We have already seen that magnetism is a universal principle, and one of the forces which nature employs in the government of the universe; we have seen, too, that the force which it exerts is centripetal, and identifies itself with the force which controls the motion of gravitating bodies; we have seen that the line of attraction from any centre around which the earth may revolve must be at an angle to her axis on which she daily turns, and that the polar attraction *is* at such an angle; we have seen that if the attraction of the needle to the pole be governed and controlled by the attraction of magnetism from a centre around which the earth revolves, and such attraction is at an angle to the earth's axis, then, that point on the earth's surface to which the needle is directed, and which we have called the magnetic

* The North and South Poles revolve together, each being always opposite to the other, and at an angle to the Earth's axis.

pole, shall revolve about the north pole in the same time in which the earth revolves about the governing centre of attraction; and we have seen that the magnetic pole does revolve about the north pole once in about six hundred and forty years, taking the period of one hundred and sixty years to be accurate, in which it has been seen that ninety degrees of the revolution has been performed.

All these conditions are necessary to the truth of our theory (and more might be both cited and proved), and they are conditions, all of which we have seen to exist; and one of these conditions, viz., the revolution of that subtle influence and immaterial point which we have called the "magnetic pole," could not exist or be performed by any other means than the magnetic attraction to the centre around which the earth revolves.

Our limited astronomy has given us the data of no higher revolution of the earth than that around the sun, although it is inferred from the order of things that she may revolve in company around a higher sphere, and to that we must look for the attracting force that will fulfil the necessity of the case. I shall here be found trespassing slightly on some of those creations of astronomical science which imagination has built on too slight foundations of truth, and which time will, I think, sweep away by discoveries in revolution as simple as that which swept away the ancient systems of astronomy from the faith of mankind. The simple turning of the earth on her axis was found to perform all those wonders, and account for all the phenomena, which men's minds had for centuries supposed employed the might of Heaven to move the whole universe around us for the accommodation of light to our comparatively little world.

The earth, we know, is balanced within a planetary system, revolving about the sun in perpetual order. We must then admit one of two things, to wit: That either the sun, with his system, revolves about another and a higher system, which is beyond our power of immediate observation; or, that the sun is fixed in the centre, and that his system embraces the whole visible and invisible heavens—which we have good evidence that it does not. The supposition is contrary to reason, and contrary to the order of revolution. We therefore assert, as a necessity, that the sun, with his system, revolves about another and a higher system, carrying the earth with him in the same manner as the earth revolves about the sun, carrying the moon with her. This is not a disputed proposition, and I only state it in this form to connect the thread of my argument.

The fact being admitted, it is reasonable to conclude that this is the highest revolution or source of magnetic attraction to which the earth —separately considered—is immediately related.* First, because the

* I have not time or room here to attempt the demonstration of the truth, but I have no doubt whatever that, although the higher revolution is the governing cause of all, there is yet a daily and a yearly revolution which it would not be difficult to trace. Dr. Bowditch mentions a daily vibration (which is no doubt a revolution), amounting to some minutes of a degree, and I recollect that a few years since the same thing was observed by M. Leverrier, Director of the

attraction will necessarily be from system to system; and, secondly, because the earth being situated in the midst of the solar system, a part of it, and only a point in it, the line of attraction would be always nearly the same; or if affected at all by any other revolution, in a planet of the earth's magnitude relatively to these great systems, the effect would be a scarcely perceptible vibration.

If these premises be all true, then it will follow that what we call the magnetic pole shall revolve about the polar axles of the earth in the same time in which the earth moving forward in company with the solar system performs a complete revolution relatively to that system around which the sun himself revolves. Let me not be misunderstood; this is not the sun's period; that of course is very much greater. The earth is only a satellite of the sun, and in the revolution of which we speak she has but repeated exactly, but on a grander scale, the same phenomenon which our own satellite, the moon, performs monthly; accompanying the earth in her orbit, at the return of every full she has performed a complete revolution, *relatively to the sun's centre*, around which the earth herself revolves. So also the earth, moving onward in company with the solar system, performs a complete revolution, *relatively to that centre around which the sun revolves in his orbit.* We have seen that the magnetic poles (for the north and south poles revolve together) perform a complete revolution round the north and south polar axles of the earth once in about six hundred and forty years, and hence we infer that in THE SAME PERIOD OF TIME, the earth, still keeping her place in the solar system, performs a complete revolution relatively to another and higher system around which the sun himself, with all his attendant train, revolves. This revolution is accomplished by the simple fact that, because the sun is in motion in an orbit, therefore the earth, in her yearly revolution around his centre, performs more than a complete revolution of one primary circle in space; and consequently, in a series of revolutions round the sun, gains one complete year relatively to that centre around which the sun revolves. It is a demonstrable truth that every period of time marked by the revolution of the heavenly bodies is greater than one primary circle, for the reason that each and all of the heavenly bodies are themselves also in motion. Our theory then is seen to be that the magnetic attraction to that high centre is the force which directs the needle to the pole—that our revolution around that centre is the cause of the revolution of the so-called magnetic pole, which last is again the cause of the variations of the compass. The

Observatory at Paris, which for want of another reason he ascribed to expansion by the sun's heat; but although magnetism is more or less intense in a high or low temperature, I cannot accept this as a sufficient cause for a change of variation. It may be caused by the sun's attraction, he being sometimes east and sometimes west of us; but the return of the needle during the night to its position of the previous day is too gradual to be caused by temperature alone. The yearly revolution, when traced out, will, I think, explain satisfactorily why the motion round the great circle is sometimes faster and sometimes almost stationary, or even slightly retrograde.

reasons given for the truths shown are sufficient for the effect—the effect is purely mechanical and plain to the sense; in harmony with the mechanism of the heavens and the order of revolution, and, until a better reason is shown, I am compelled to believe in its entire truth.*

The cause of gravity has never yet been explained or understood, notwithstanding that much is known of the laws which regulate it. Newton discovered that a falling body was governed by certain laws, and that these laws were applicable to the motions of the heavenly bodies, and this he called gravity, or the "attraction of gravitation." But neither he nor any one else, that I am aware of, ever explained in any satisfactory manner, even to himself, the *cause* of this gravity. But if my positions be true, it will appear that one law governs polar attraction, centripetal force, and the gravitation of bodies, viz.: a latent magnetism set at liberty, rendered active, and *in*-volved by a forward revolution.

The earth attracts all bodies to its centre, and a stone, because of its greater density, will fall quicker through the atmosphere than a feather; but I regard density as only an element of velocity in overcoming the resistance of a medium, and the atmosphere being withdrawn, the feather, attracted by the magnetic force, will fall as quick as a stone.†

There is one other result that must follow the truth of my hypothesis, too important to be omitted here.

It is well known that the motion of any body revolving about another body, also in motion, is necessarily spiral, and therefore the

* In limiting the period of the revolution to 640 years or thereabouts, it will be observed that the correctness of that period depends entirely on the accuracy of the observations and record of the variations of the needle from time to time. And as a consequence of the sensitiveness of the needle to diverting causes from local attraction, and the slowness of the motion, which renders it difficult to note the exact period of its passage of any particular meridian, together with the probable imperfection of the instruments in early use for observation, on which the records depend, even if all we have here said be perfectly true in principle, the actual period when found may prove to be somewhat longer or shorter than the period here named. Astronomers have suggested an indefinite period of six or seven hundred years, which I have sometimes seen mentioned, and which marks an epoch with them. They may, perhaps, find little difficulty in harmonizing it with this revolution.

† The subtilty and force of magnetism was illustrated by Laplace, under the name of gravitation. He says, "that if a new planet were thrown into space, it would instantly feel the force of attraction from surrounding bodies whatever their distance, and the velocity of that force, from one body to the other, would be many million times greater than that of light;" but I am not aware that he ever associated magnetism with gravitation, or treated of it as a universal principle and an active force in nature. Certainly he never considered the two as identical. Most of the inquiries of scientific men into the principles of magnetism have, as I believe, been expended in experiments on *magnets* instead of *magnetism*. I can very well believe Laplace as to the velocity of magnetic attractions. We have an example of velocity in the Atlantic Cable. The electric influence is computed to have passed over a distance of 2,000 miles in $\frac{1}{10}$ of a second,—but even that time was probably employed by the thought of the observer in marking the time, and the electric current passed in no appreciable space of time.

motion of the magnetic pole, revolving about the north pole, and being governed and controlled by the attraction of a body in motion around which the earth is revolving, shall also be spiral, never returning to exactly the same point. And hence because one law and one force governs both the motion of the earth and the revolution of the magnetic pole, therefore the polar axle of the earth *shall change* its position with every revolution of the magnetic pole, in such manner that the present poles of the earth's axis, in her diurnal revolutions, will, or may, at length reach the present line of the equator, and the equator will then become the poles! and thus the idea suggested by geology, that the present poles of the earth have, at some time of the earth's existence, been an equatorial region, becomes a problem solved, and reduced to a simple and undeniable truth. Not a doubt exists in my mind that such has been the fact and will be again; and I am not less satisfied that the Glacial theory of Professor Agassiz, so far as the fact is concerned, that parts of our own land, and of others in Europe and elsewhere, have at some time been the country of glaciers, is no longer a speculative idea, but a *mathematically demonstrable truth.**

The early system of astronomy was, I think, incompetent to the solution of a question like the revolution of the solar system; and modern astronomy has done so little towards it, that it must be considered as yet open to examination and argument. I have hope, therefore, that the suggestions here made may prove a step towards a more perfect knowledge of it.

Years ago, when I first thought of the subject here treated of, it was only in relation to the variations of the compass as observed at sea, and its practical application in commerce and navigation. But I perceive that I have risen to much higher themes, and perhaps some may say, meddled with things too high for me; but I am unable to perceive that I have at any time gone beyond a just inference from the truths shown.

The simplification of the vast speculative ideas of geologists and others, that this examination has suggested to my mind—my thorough conviction of their essential truth, and that the truths here shown may be availed of for the increase of knowledge and the improvement

* There is a truth known to astronomers, which I think strongly confirms this point of my argument. It is this: In the longitude of Athens it is known that the sun in Cancer does not come so far north, by nearly a degree, as it did two thousand years ago. Astronomers have inferred therefrom that the tropics are narrowing, and the earth consequently is drawing nearer to the sun. But this I think is a mistake, and that the phenomenon mentioned proceeds from the change in the line of the equator, as I have explained it; and that if we had had the opportunity, two thousand years ago, of observing south on the meridian of Athens, it would then appear that Capricorn has receded south to the same extent as Cancer, and *vice versa* at the Antipodes. It would also depend on what distance the meridian of Athens may be from the point where the former line of the tropic would bisect the present line, whether on some other meridian, distant from Athens, the sun's recession may not have been much greater than is seen at Athens. But for all evidence of this kind, the observations of astronomers are totally wanting.

of science, are my reasons for making public my reflections on these matters. I submit them to the fate which future developments may award to their truth or falsity.

The author again says, in allusion to the statement here mentioned on page 544, I have asserted the gradual changing of the poles of the earth, "in such manner that the equator may at length become the poles." It is not probable that in the progress of such change, the North Pole, for example, can move southward, in any direct line. That also may revolve, and perhaps surround the globe spirally, following the plane of the ecliptic, and to that opinion I am inclined, as the most natural, and the mechanical result of the force exerted.

Astronomers have observed some change in the poles of the earth, relatively to the north star, but I am not aware that they have considered it as an actual change of the position of the pole itself, and without that, their efforts to account for the geological formations, and the glacial epochs, are to my mind, unnatural, laborious, exceedingly complex, and *wholly insufficient.*

It has been suggested to me, that my assertion that "there is no absolute magnetic pole," and constantly treating it as real, is contradictory and unintelligible; and I admit that it requires a better explanation than has yet been given. It is unfortunate for us, that to make ourselves understood we are obliged to use the imagery of material things to express an idea of immaterial things; magnetism and electricity are without the pale of matter such as we can comprehend, and therefore, to describe the subtile and peculiar influence concentrated at the magnetic pole, we must help our thoughts by a figure. I would describe the magnetic pole then, not as a moving point, but as a focus of mingling rays, the centre of which is the daily revolution. If we could be present at that centre we should neither see nor feel anything different from what we do here, but the magnet would be sensitive to any approach to it, and probably feel its influence far off, like the gravitating force of water on its approach to the Maelstrom.

In a foot note, in p. 541, I have said that I have no doubt but there is a daily revolution of the magnetic pole, which has been considered by astronomers as a mere vibration, caused by expansion from the sun's heat. But let it be understood that it is a revolution as we have explained it, and caused by the revolution of the earth on her axis. It will be recollected that while the earth turns round once on her axis, she at the same time moves forward more than one million six hundred thousand miles in her orbit. Now if we can determine or assume the diameter of this daily revolution, or breadth of the vibration, whichever we please to term it, it is a basis for calculating the distance of the attracting force which governs the revolution. And the distance of the attracting force, which is such as to reduce the angle, which has over one million six hundred thousand miles for its base, to a few minutes of a degree on the earth's surface, is thousands of millions of miles from us; and incomprehensible as it may seem, that distance may yet be known.

The idea is attributed to Sir David Brewster, that "magnetism is most intense in a low temperature." That is, no doubt, quite true by itself, and yet, the truth may reach much farther than that. What if it should be found that variations in the intensity of magnetism are the *cause* of changes of temperature? There is much reason to suspect that to be the case. It is seen that the temperature on the northern part of this continent (America), where the magnetic pole is at present situated, is subject to greater extremes than on the shores of Europe, or the coast of the Pacific in the same latitudes. I have reason to believe also, that the Polar Sea is more open by an eastern route round the North Pole than by the route, of Hudson's or Baffin's Bay, and next to my surprise that the voyage round the pole should ever be undertaken, is, that it should not be undertaken by the eastern route or by Behring's Straits. Four hundred years ago, when the magnetic pole was situated on the opposite side of the North Pole from Greenland, history tells us that that country was literally a *green land*. Since that time the magnetic pole has passed near to or over its northern portion, and it has become a country of ice and snows. The south magnetic pole is situated in about longitude 62° east (opposite the north), and if I am not mistaken, in that region, the barriers of ice obstruct the southern progress in a lower latitude than in other parts of the Southern Ocean. These things are highly worthy of a careful investigation by the learned.

A friend of very acute perceptions, and who has taken a great interest in the problems which I have endeavoured to solve, asks me the question, "What will you do with the flattened poles of the earth,—does the earth change her shape with the changes of the pole?"

The question is pertinent and of force, and if required to answer it, my answer for the present would be this: Admitted that the poles are really flattened as they appear to be. It is known that both the north and south poles are situated in the midst of a wide and deep sea. The breadth of these seas is such that, admitting the truth of my hypothesis, the poles must have been within their area for many centuries past, and will continue to be so for many centuries to come. Let us suppose that the extreme radius of the flattened surface is fifteen degrees of the earth's surface on all sides of the pole; at that distance from the centre (the polar axle) the velocity of the earth's revolution on her axis will become such, as may tend, by its centrifugal force, to raise the surface of the water, or so to lessen its gravity towards the centre of the earth as to raise the surface somewhat. By a natural consequence, this force will increase towards the equator till you reach that point, or the greatest diameter of the earth east and west. By the same natural consequence, the centrifugal force will diminish as, from the radius of fifteen degrees distant, you approach the pole, where the centrifugal force is entirely lost. The water at the poles, then, being undisturbed in its gravity by the centrifugal force, will press outward from the centre and the poles become flattened. I see nothing irrational in this supposition; and it will be obvious at once that when the poles shall have passed over these seas, and be centred on the firm

continents, the waters will assume their even gravity, and the earth assume her perfect globular shape.

Or, if this reason is not satisfactory, perhaps it may be thought to be a tidal influence, caused by the attraction of the sun and moon, which gathers the waters towards the equator, and draws them away from the poles; the effect would still be the same in causing the flattening of the poles, and restoring the earth to her globular shape, when the poles have passed the area of the wide seas in which they now exist.

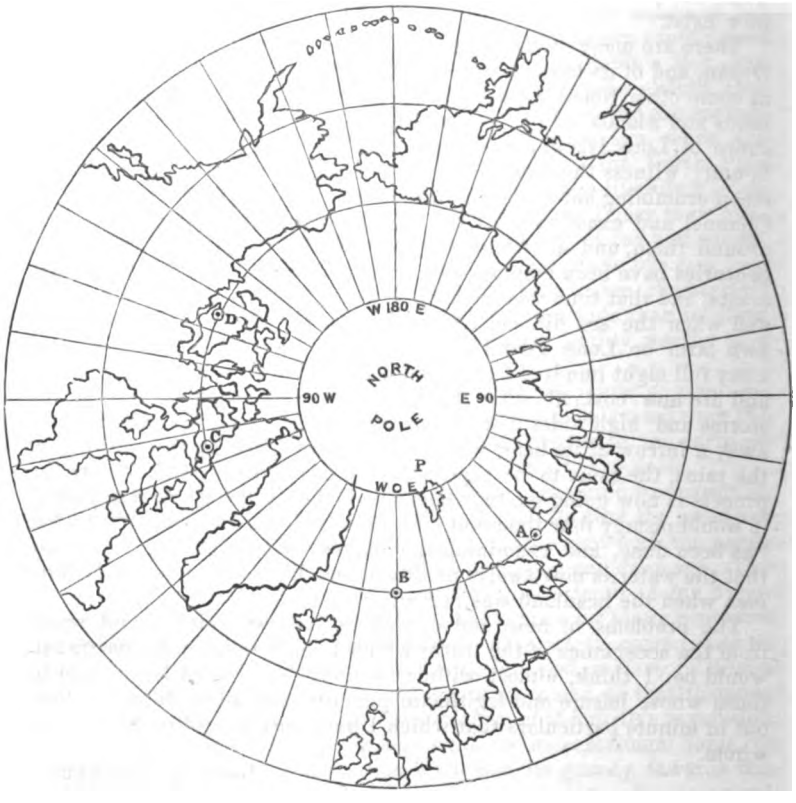
There are many evidences to show that the waters of the Atlantic Ocean, and of its bays and sounds, are fuller now than they have been at some other time long past—such as the washing away of the headlands and islands of our sea-coast (America). Witness the northern shore of Long Island and the numerous bluffs now half sunk in the Sound; witness the numerous islands in Massachusetts Bay and their steep crumbling sides and diminished areas; go across to the British Channel and examine the Cliffs of Dover and the bottom of the sea around them, and abundant evidence may be found, both that many centuries have been employed to undermine and pull down their lofty crests, and that time was when they were not so as they are at present, and when the sea did not reach their base. There is a bluff on my own farm on Long Island sixty feet high, which has been washed away full eight hundred feet inland, and the boulders have fallen down, and are now covered with the tide. Once or twice every year the storms and high tides rise up over the beach and lap up and carry away a furrow at its base, which is filled up again by the washing of the rains, the same to be repeated year after year. At the rate the process is now going on, say about two inches of the whole face yearly, it would occupy four thousand eight hundred years to accomplish what has been done, and examining the channel outside of it, I would say that the water is now twelve or fifteen feet higher than it *could have been* when the headland was perfect.

The problems of new and exceeding interest which would result from the acceptance of the truths which I claim to have demonstrated, would be, I think, almost without bound; but I must leave them to those whose leisure and legitimate pursuits will allow them to follow out in minute particulars that which I have only sought to grasp as a whole.

JOHN A. PARKER.

[The subject discussed by Mr. Parker in this paper (commenced in our last number), read before the American Institute, opens out some highly interesting points, not only to the mariner but to the scientific man. It connects the variation of the mariner's compass with conditions concerning our solar system of which he is little aware. And as the progress of the magnetic pole, with its position at different periods, alluded to by Mr. Parker, is well worthy of being shewn, we have appended to the whole a little map in which he may inspect those positions. In page 473 of our last we have alluded to it in reference

to those positions. The theory of this progress with which the observations of variation seem to agree, appears to be one of those simple facts with which the works of the great Architect of nature abound. The map moreover will enable the reader to refer with those accounts relating to Arctic matters for positions concerning navigation from Behring Strait to Spitzbergen, or attempts to reach the pole, one of which is at present in progress.—ED.]



THE LUMINOUS SEA.

(Concluded from page 490.*)*

THE following experiments which I made upon this subject, would lead me to make different conclusions from those of the preceding authors.

Experiment I.—A glow-worm was put into a glass of water, in

which it lived nearly two hours, and continued to emit light as usual, until it died, when the luminous appearance entirely ceased.

Experiment II.—The luminous substance was extracted from the above-mentioned glow-worm, and from others killed in different ways; but it afforded no light.

Experiment III.—The sacs, containing the luminous matter, were cut from the bellies of *living* glow-worms, and shone, uninterruptedly, for several hours in the atmosphere; and after their light became extinct, it was revived by being moistened with water: some of these were put into water in the first instance, in which they continued to shine, unremittingly, for 48 hours.

Experiment IV.—The luminous substance of a glow-worm was exposed to a degree of heat which would have been sufficient to inflame phosphorus, without increasing the brilliancy of its light; and further, it could not be made to burn by being applied to a red-hot iron, or to the flame of a candle.

Experiment V.—A delicate thermometer was introduced among some living glow-worms, during the time, they gave out much light: the temperature of the room being 69, the instrument rose to 75, 76, 77, according to circumstances, as the warmth was reflected from the hand, or dissipated by the worm crawling over cold substances. The luminous portion of the tail, when very brilliant, appeared to raise the thermometer quicker than the other parts of the body; but it was not invariably the case. When shining strongly, I thought that the luminous rings communicated a sensation of warmth to the hand, but this was probably a deception, as the actual degree of heat was not sufficient for such an effect. It should however be mentioned, that in Templar's observations on the glow-worm, he said his feelings deceived him if he did not experience some heat from the shining of the insect.

Experiment VI.—To satisfy myself how far the evolution of heat during the shining of glow-worms depended upon the life of the animals, I cut off the luminous portion of the tail from several living worms, and found that if the thermometer was applied to them immediately, it was raised by them one or two degrees; but after these parts were dead, although they continue to emit light, they produced no effect whatever upon the instrument.

Experiment VII.—Some hemispherical medusæ were put into a spoon, containing a small quantity of sea water, and held over a burning candle. As soon as the water became heated the medusæ appeared like illuminated wheels, the spots at the margin and centre alone emitting light; in which manner they shone vividly and permanently for about twenty seconds when they shrunk and died, after which they were no longer luminous.

Experiment VIII.—Some of the same species were put into spirits; a strong and unremitting light was instantly given out, which issued from the central and marginal parts, as in the preceding experiment, and continued until they died.

Experiment IX.—Some of the scintillating and hemispherical species of medusa, contained in a small glass jar, were introduced into the

receiver of an air pump and the air being exhausted, they shone as usual when shaken; if any difference could be perceived the light was more easily excited, and continued longer in a vacuum.

I wished next to try the influence of electricity on the luminous property of animals.

Experiment X.—A medusa hemispherica was placed in a small glass dish, containing a quantity of water, merely sufficient to allow the animal to preserve its figure; being insulated, it was electrified, and sparks drawn from it, which had not the slightest effect; the experiment was repeated several times with different individuals, but without exciting the animals to throw out light.

Experiment XI.—Some hemispherical medusæ were placed in contact with the two ends of an interrupted chain and slight electric shocks passed through them. During the very moment of their receiving the shock no light was visible but immediately afterwards the medusæ shone like illuminated wheels, which appearance remained for some seconds. Upon the closest inspection with a magnifying glass, no contractile motion could be perceived to accompany the exhibition of the light. The application of electricity in this instance seems to have acted merely as a strong mechanic shock.

The above experiments on the luminous medusa were made at Herne, with the assistance of George May, Esq., of Stroud House, and in the presence of a large company capable of accurately distinguishing their results.

It seems proved by the foregoing experiments, that so far from the luminous substance being of a phosphorescent nature it sometimes shews the strongest and most constant light when excluded from oxygen gas, that it in no circumstances undergoes any process like combustion, but is actually incapable of being inflamed; that the increase of heat, during the shining of the glow-worm is an accompaniment, and not an effect of the phenomenon, and depends upon the excited state of the insect; and lastly, that heat and electricity increase the exhibition of light, merely by operating like other stimuli upon the vital properties of the animal.

In confirmation of these opinions, I may quote the high authority of the Secretary of this Society, who has found that the light of the glow-worm is not rendered more brilliant in oxygen, or in oxygenated muriatic gas, than in common air; and that it is not sensibly diminished in hydrogen gas.

I may further add that Spallanzani's experiments of diffusing the luminous liquor of the medusa in water, milk, or other fluids, are in direct contradiction of his own theory, as is also the extinction of the light of these mixtures by the application of a high degree of heat.

If the light emitted from animals were derived from their food, or the air they respire, as supposed by Carradori, the phenomenon should be increased or diminished, according to the quantity of food or air, that the creatures consume; but we do not find this to be the case, for in those situations where they are sometimes found to be most

luminous, they are deprived in a great measure, of these assumed sources of their light.

In fact, the luminous exhibitions of living animals are not only independent of all foreign light, but are frequently destroyed by the latter. I have always found the shining of the medusæ to cease upon the rising of the moon or at the approach of day; and when out of the sea I never could excite them to throw out light until they had been kept for some time in the dark; all the luminous insects likewise secrete themselves as much as possible during the day time, and go abroad only at night. I have it is true, found that the scopolendra electrica will not shine unless it has been previously exposed to solar light; but I have observed that it shone as brilliantly and as frequently, after being kept a short time in a light situation, as when left uncovered the whole day, the circumstance of the scolopendra requiring exposure previous to its giving out light, is very unaccountable, as the insect, when left to itself, always seeks as much as possible concealment during the day; indeed it is the opinion of some naturalists that it is killed by the light of the sun.

The opinions of Brugnatelli and Carradori are connected with some general doctrines, respecting the nature of light, which I shall not at present venture to discuss. It appears to me, that the question is still unresolved, whether light has a substantial existence, or is a phenomenon depending upon certain operations or conditions of the ordinary forms of matter. But the highly ingenious researches of Count Rumford, on the law of what have been called subtle fluids, and the extraordinary advances lately made by Mr. Davy, on the decomposition of substances, that were hitherto looked upon as elementary, give us reason to hope, that future investigations may unfold views of the material world, of which we can at present have only an indistinct conception; that new modes of analysis may enable us to see things, not "through a glass darkly," but more nearly as they are; and that the boundaries of physical and metaphysical science, now so far asunder, may be made to approach each other.

In the present state of our knowledge, our business should be, to collect, arrange, and compare phenomena, rather than to speculate upon their nature. Nevertheless, I cannot refrain from observing, that the circumstances attending the luminous appearance of living animals, are much more favourable to the supposition of light being a property, than a substance. The quantity of light emitted by an animal in a certain time (admitting it be matter) far exceeds that which could be possibly supplied by the sources, whence it is usually supposed to be derived. Thus the luminous appearance of some medusæ may be continued with the intermission of short intervals for an indefinite time, notwithstanding the creature be kept in darkness, and without any other food than what a small quantity of filtered sea water would afford. The uninterrupted and long continued light that is sometimes evolved by the luminous seas, and the ova of the glow-worm, is also inconsistent with the notion of an accumulation and subsequent dispersion of a material substance.

I shall terminate this paper by an enumeration of the several conclusions, that are the result of the observations I have been able to make upon the phenomena of animal light.

The property of emitting light is confined to animals of the simplest organization, the greater number of which are inhabitants of the sea. The luminous property is not constant, but in general, exists only at certain periods, and in particular states of the animal's body. The power of showing light resides in a peculiar substance or fluid, which is sometimes situated in a particular organ, and at others diffused throughout the animal's body. The light is differently regulated, when the luminous matter exists in the living body, and when it is abstracted from it. In the first case, it is intermitting, or alternated with periods of darkness; is commonly produced or increased by a muscular effort, and is sometimes absolutely dependent upon the will of the animal. In the second case the luminous appearance is usually permanent until it becomes extinct, after which it may be restored by friction, concussion, and the application of warmth, which last cause, operates on the luminous matter (while in the living body) only indirectly by exciting the animal. The luminous matter in all situations, so far from possessing phosphoric properties, is incombustible, and loses the quality of emitting light, by being dried or much heated. The exhibition of light, however long it may be continued, causes no diminution of the bulk of the luminous matter. It does not require the presence of pure air, and is not extinguished by other gases.

The luminous appearance of living animals is not exhausted by long continuance, or frequent repetitions, nor accumulated by exposure to natural light; it is therefore not dependent upon any foreign source, but inheres as a property in a peculiarly organized animal substance or fluid, and is regulated by the same laws which govern all the other functions of living beings.

The light of the sea is always produced by living animals, and most frequently by the presence of the medusa scintillans. When great numbers of this species approached the surface, they sometimes coalesce together, and cause that snowy or milky appearance of the sea, which is so alarming to navigators. These animals when congregated on the surface of the water, can produce a flash of light, somewhat like an electric corruscation. When the luminous medusæ are very numerous, as frequently happens in confined bays, they form a considerable portion of the mass of the sea, at which times they render the water heavier, and more nauseous to the taste; it is therefore advisable always to strain sea water before it is drunk.

The luminous property does not appear to have any connection with the economy of the animals that possess it, except in the flying insects, which by that means discover each other at night for the purpose of sexual congress.

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The Expedition of the *WASP* and the *SATELLITE*.

Considerable light was thrown upon the dark mystery surrounding the fate of missing ships by a tale told at Penang, in October, 1866, by three men, who succeeded, alone and unassisted, in bringing the brig *Futteh Islam* into Penang harbour. What they said was substantially this. The *Futteh Islam* sailed from Penang, in August, 1866, bound for Rangoon. She was forced, through stress of weather, to take shelter on her way, and put into Nangkawri, a harbour in the island of Trinkut, one of the Nicobar group. The Nicobar Islands are in the Bay of Bengal, and lie south-east of the Andaman Isles, between the Andamans and Sumatra. The brig, with a crew of twenty-four, all told, anchored about a quarter of a mile from the shore, and the natives came off in their canoes, apparently with the object of trading. They brought cocoa-nuts, poultry, and vegetables, to exchange against cloth, knives, tobacco, and spirits; and they conducted themselves with the utmost propriety—for them—till the fourth day after the brig's arrival. On the fourth day, some thirty men came off in canoes, and lay alongside, while the chief went on board to converse with the master.

After a short time spent in this way, the chief looked over the side, and called for some one to give him fire for his pipe. Fire was brought in a thick bamboo, which was handed to the chief, who lighted his pipe, and then, taking the master unawares, knocked him down with the cane. This was a signal for the men in the canoes to rush on board with clubs and spears, and to commence an indiscriminate slaughter of the brig's crew. Three men succeeded in escaping to the hold, where they hid themselves behind mats and wood; and when they judged, from the cessation of the noise above, that the ruffians had quitted the ship, they stole out at evening, and found themselves alone in a ransacked ship, of which the decks were covered with blood, though the bodies of the slain had been apparently flung overboard. Whether it was the intention of the islanders to return and finish their destructive work, did not appear; but the three survivors of the crew managed, as night came on, to slip the cable and put to sea.

After eight days of anxious navigation, the three brought the *Futteh Islam* into Penang harbour, and told the grim story of their comrades' fate. This, coupled with strange rumours which had come up from time to time respecting nefarious acts done at the Nicobars, determined the authorities at Penang to clear up the mystery. In June, 1867, H.M.S. *Wasp* was sent to Nicobar to make inquiries. Coming to Trinkut, where the men of the brig were murdered, she found two vessels at anchor, engaged in trade with the natives. From the master of one of these, Captain Bedingfield, of the *Wasp*, learned that about eight months before he had seen a white woman a captive among the people; and that six years ago, the wife of a murdered captain of a vessel had been maltreated, and finally put to death. Several other instances of piracy, coupled with murder, were stated; and from what Captain Bedingfield heard, he was led to believe that there were yet

living among the Nicobarians white women who had been taken out of ships which had been destroyed after the murder of their crews. He returned to Penang for assistance; and on the 19th of July, 1867, the *Wasp* left again with the *Satellite*, Captain Edye, for Nicobar. On the morning of July 22nd, the ships made Great Nicobar, and anchored near the village of Trinkut, which was seen pleasantly situated, extending along the shore of a bay, the houses large and built on piles, with cocoa-nuts and palm-trees and thick jungle in the rear. On the beach was a large number of war canoes. The object of the commanders was to obtain intelligence of the men of the *Futteh Islam*, or of any other captives; to obtain compensation for past wrongs, and a guarantee against violence in the future. Knowing the treacherous character of the people, it would never have done to land without such a force as might overawe them.

A considerable body of seamen and marines were therefore landed under the command of Captains Bedingfield and Edye; and as soon as this was done, the natives fled to the jungle, leaving no one to give information. The invaders marched into the village, and found fearful confirmation for all previous suspicions as to the character and habits of the Nicobarians. In the houses were large quantities of ships' gear, sailors' chests, tool-boxes, sofas, cushions, fittings of ships, nautical instruments, and arms. Selections were made as samples of what had been found; and then, the people refusing to come back or to afford satisfaction, the village was set on fire and burned, together with the war canoes on the beach. From Trinkut, the *Wasp* and *Satellite* proceeded to the harbour of Nangkawri. A detachment of Madras native infantry, who had been brought down in the *Satellite*, were landed, and in conjunction with the seamen and marines under Captain Edye, proceeded to take possession of the village of Enounga, from which, as from Trinkut, the people all fled. Six men, however, were captured by Captain Edye and sent on board the *Satellite*—dreadful looking savages, with Malay faces, stamped with the mark of every coarse disgusting passion, with flat noses, thick lips, high cheek bones, and a sullen, cruel expression.

A careful examination of these men, and of some others captured by Captain Bedingfield, on the *Wasp's* former visit, led the commanders to the sad conclusion, that all the captives who had been living in the islands had been murdered, with the exception of one little girl, about seven years of age, who had been taken with her mother out of a French ship some little time before. This child was said to be in the keeping of Acheeup, a chief of the island where the ships now were; and it was resolved, at all events, to recover her, and to punish the islanders for their atrocities; for at Enounga, one of the largest of the villages, the expeditionary force found proof positive of a system which must have been carried on for many years—a system of deliberate piracy, by which ships, having been inveigled into the harbours of the islands, had been seized, the men murdered, the women reserved for a worse fate, and the ships themselves taken outside and scuttled, on the principle of dead men telling no tales. But though the ships were

gone, there remained those things belonging to them for which the piracy had been committed. At Enounga, and at every village, the houses were stocked with ships' furniture and ships belongings, many of but little use to the possessors, and some of no use "to any one but the owner." At one place was found a copy of *Christopher Tadpole*, on the fly-leaf was written, in a woman's hand: "When shall we meet again? Perhaps never!" and then, with several memoranda of addresses, appeared some caricatures drawn in pencil.

On the 23rd of July, the English being in possession of the seaboard two of the prisoners taken by Captain Edye were sent to Acheeup's encampment to tell him that, unless he gave up the little captive girl he had with him by noon the next day, the villages of the island, with all their contents and all the war canoes, would be destroyed. In the meantime, a searching examination was made by the captain of the *Wasp* into all that the prisoners knew about the piratical habits of the people; and while these men confessed to having seen the crews of four vessels murdered in Nangkawri harbour alone within two years and a half, they all agreed that there remained now only one stranger, the little girl, captive in the island. All the rest had been murdered. No answer having been sent by Acheeup, the work of destruction commenced. All the villages in Nangkawri except three were burned; and all the war canoes, some of them being particularly handsome, and seventy-six feet long. One of the villages spared belonged to Acheeup, and it was intended to try still further the effect on him of holding the threat of burning the village *in terrorem* over him. On the 26th of July, therefore, two more of Captain Edye's prisoners were sent to the camp to tell Acheeup that his village would share the fate of the others if the captive girl was not immediately given up. The messengers returned promptly with the child, a half-caste, who, it seems, had been taken out of a French vessel from Karical, her mother having also been captured, abused, and murdered. On the 28th of July, a man called by the sailors 'Sir John Nichols,' who was a prisoner on board the *Wasp*, jumped overboard, intending to swim for the shore, about a mile distant. Hardly had he gone thirty yards, before an alligator, of which animal the harbours are full, caught hold of him, and with a shriek the man disappeared.

Trinkut Island was the last of the Nicobars of any importance that remained to be visited—Camorta had been already ravaged—was seized on the last day of July, and Acheeup himself was induced to come on board the *Wasp*, under promise of a safe-conduct to and from the shore. He was a rough, rude specimen of a brutal man, with elephantiasis on both legs and feet, and shewing by externals his fitness to be ruler over his followers, in that he was infinitely more hideous and savage-looking than they. Nothing more could be elicited from him than was already known to the commanders; and after some hours spent on board the man-of-war, he was allowed to depart, in accordance with the promise made to him. The upshot of the whole matter was this; it was established beyond all doubt that a system of

murderous piracy had been carried on for years by the people of the Nicobar Islands, and that it was the custom of the pirates to retain their female prisoners, but to murder the males. The only living captive was rescued, and a punishment general and severe was inflicted upon the islanders, as a return for their past atrocities, and as a warning for the future. It was also determined that it is indispensable for the safety of life and commerce that the Nicobar Islands should be included in the regular cruising ground of one or more of our ships of war. It is even a question whether, in the interests of humanity at large, places which are capable of being made nests of such detestable pirates, should not be annexed and governed by some power capable of keeping them clean.—*Chambers's Journal.*

THE RECENT PREVALENCE OF EARTHQUAKES.

WE have preserved in our recent numbers a full account of the earthquakes and volcanic eruptions of the great Mauna Loa in the Sandwich Islands, that seem to surpass in magnitude all others of any recent date. And we find in the columns of that well conducted journal, the *Daily News*, some remarks under the above title which are so apposite to the subject that besides the fact of their being the production of a high authority, there is so much novelty and interest in them that we preserve them for our own readers.

There are periods in the history of the earth when subterranean forces seem to acquire more than their usual intensity, and proclaim their activity by producing volcanic eruptions and destructive earthquakes in regions widely remote from each other. Ordinary earthquakes, that is, vibrations of the earth's crust which are but just sensible, and produce no destructive effects, are at all times sufficiently common. It has been estimated, indeed, by one of our most eminent scientific men, that not a day, scarcely even a moment, passes without a vibration, more or less intense, occurring in some part or other of the earth's crust. But destructive earthquakes are not phenomena which present themselves with any such approach to uniformity. Often several years have passed without the occurrence of any remarkable earthquakes; and it is comparatively seldom that those tremendous upheavals occur which produce in a few minutes the destruction of whole provinces.

Recently, however, as we have said, the earth's subterranean forces have been unusually active. We all remember how the inhabitants of St. Thomas suffered from the great earthquake which followed the great hurricanes of the autumn of 1867. The subterranean throes which inflicted so much injury continued to be felt for many weeks, and even now threatening vibrations occur at intervals to remind the much tried people that they are still exposed to a renewal of their misfortunes. Then we heard of earthquakes in Malta, in Egypt, in Formosa, in St. Salvador, and one even was felt in the quiet plains of

Somersetshire. Not long after, hundreds of the inhabitants of the Sandwich Islands were destroyed by an uprush of molten matter from beneath the violently shaken bed of the Pacific Ocean. Vesuvius had all the while been in violent eruption. Then, after a short rest, Vesuvius again breaks forth, Gibraltar is shaken by a violent shock; the inhabitants of New South Wales, usually undisturbed by subterranean forces, are startled by an earthquake; and finally, we hear of a great earthquake in that most unquiet of all portions of the earth's surface, the country west of the Andes. In this last instance, the shock seems comparable with the most fearful earthquakes that have ever been experienced. If we can trust the news we have from New York, we must believe that ten or twelve towns have been laid in ruins. The same account states that upwards of 30,000 lives have been lost, and upwards of fifty millions of pounds' worth of property destroyed.

We have little in this long list of events to encourage the notion which many entertain, that the earth's subterranean forces are gradually diminishing. We believe, indeed, that this view has arisen from the circumstance that the older geologists mistook the effects of many centuries of subterranean action for the results of a single outburst. The careful researches of the more experienced modern geologists have sufficed to show that ancient earthquakes and volcanic eruptions closely resembled those which take place at the present time, not only in the character but in the intensity of their action. There may be a gradual process of diminution, but the best evidence we now have tends to show that the rate of diminution is too slow to be perceptible. We cannot point to a time within the limits even of geological history, at which the earth's internal forces were markedly superior in activity to those whose action we are at present cognisant of.

On the other hand, we do not consider that there is any evidence in favour of the view which has recently been put forward by some speculative geologists, that internal forces may one day acquire sufficient intensity to effect the earth's complete annihilation. The risk that during some sub-oceanic volcano a large volume of water should rush into the interior of the earth, and being there suddenly converted into steam, should forthwith rend the massive globe in which we live into a million fragments, is one about which we need not greatly trouble ourselves. Admitting the possibility of such a catastrophe, we may console ourselves with the thought that for many ages the earth has been quite as much exposed to the danger as at present, and that as she has escaped it so long she will probably escape it for yet another long series of ages.

But it is worth noticing, that so far as the future history of our race is concerned, it would be a far more serious misfortune if the earth's subterranean forces were gradually to become extinct, than it would if they were to increase in energy within a moderate limit. In the latter case, indeed, many more lives would be lost, and a far greater amount of property would be destroyed than at present. But in the former case the earth would simply become uninhabitable. It is

remarked by Sir John Herschel, that "had the primeval world been constructed as it now exists, time enough has elapsed, and force enough directed to that end, has been in activity, to have long ago destroyed every vestige of land." The action of the sea waves upon the shores of continents, and of rain and rivers upon their interiors, would have sufficed to have washed all the earth beneath the level of the sea. Earthquakes—or rather the subterranean forces of which they are the evidence—are the very life of the earth; and so far from hoping that their effects may gradually become less and less perceptible, we ought to look with anxiety upon such a result—not, indeed, as affecting ourselves, but as affecting our remote posterity.

Nor is this all. It would be impossible to over-estimate the value of the services of earthquakes in storing up for us materials on which we largely depend for our comfort, and even for our very existence. But for them the coal we burn would never have been compacted—and so fitted for our use—during its long submergence beneath the ocean; the soils of various character from which our forests and our fields derive their nourishment, would have had no existence; the very materials from which we build our houses, would either have been wholly wanting, or would have been less perfectly adapted to our requirements. Not less important is the influence of the earth's subterranean activity in modifying the forms of continents, in affecting the direction of the great mountain chains which traverse them, and in regulating the distribution of land and water. Even the climate of a country owes its character to long past earth throes. Here in England, for example, we enjoy a mildness of climate, a warmth in winter, and a coolness in summer (that of 1868 being always excepted), which we should never have been favoured with were it not for the influence of that very portion of the earth's subterranean forces which has been in action in St. Thomas and more recently in Peru. The Gulf stream, which tempers our summer heat and our winter cold, would have had another direction were it not for that long range of mountains which forms the back bone of the two continents into which the new world is divided. If that range had not existed, each of these continents would have been converted by the action of the sea into an island, and the waters of the great equatorial Atlantic current would have passed out into the Pacific ocean.

Perhaps the question which most importantly affects us is neither that of the dying out of subterranean actions, nor that of their ultimately becoming sufficiently powerful to effect the earth's destruction. Each of these views may be looked on as wholly speculative, since we have no evidence whatever in favour of either. But although we may be satisfied that, to use the words of Sir Charles Lyell, "the energy of subterranean movements has always been uniform as regards the whole earth," and therefore that it will probably continue so, yet we must at the same time recognise the possibility that regions which are now the scene of intense subterranean activity may one day be comparatively at rest, and that regions now at rest (as England, for example) may one day become in turn the great theatre of subterranean

action. We cannot, says Lyell, found the opinion of our continual immunity from the effects of destructive earthquakes on the fact that "they may for a cycle of years have been invariably confined, as at present, to large but determinate spaces." The whole evidence of geology goes to show that regions now at rest have once been violently disturbed during a long series of ages, and that most of those now disturbed have in old times been at rest.

In reference to the South American earthquakes, a Panama paper says:—"The news in our columns to-day is the most appalling and painful we have ever laid before our readers. Thousands upon thousands of lives have been called instantly into eternity; whole cities, towns, and villages have been swept away from the face of the earth, and ships with their crews have been whirled from their anchorages by the receding sea, and swallowed up. Such a picture of general destruction and desolation extending for hundreds of miles along the coast, and reaching up to the topmost heights of the Andes, can scarcely be imagined. The reader stands aghast with horror in attempting to contemplate and to comprehend the magnitude of the devastation which has occurred. It is impossible to say if the desolation is at an end. There are many points in the interior and further south of which nothing has yet reached us from the Colombian frontier."

SCIENCE MADE EASY WITH OUR *DAILY NEWS*.

IT is gratifying to see one of our leading daily prints enriched with articles such as we gladly quote in our present number. For abounding, as they do, in the sublimest of truths in the most interesting branches of Science, and these conveyed in what is justly called a popular mode, or one which admits of their being perused by the ordinary reader, to whom they are made perfectly intelligible; such productions, we say, must tend not only to raise the minds of their readers, but reflect honour and credit on the conductors of such journals, Of this caste of literature is the following extract on a branch of Astronomical research, at present new even to the followers of that science, and which branch has been alluded to in the paper that precedes it on the Mariner's Compass, from the American Institute. The other paper to which we have alluded on earthquakes is another from the same source as that which follows. When subjects of the lofty nature of these and others that we have met with on the asteroids of our system, earthquakes, and such matters in this same Daily journal, all treated with by a masterly and thoroughly informed mind; when such productions, we say, take their places in common with highly interesting "Rambling Notes" of foreign places, and all the various political and secular subjects of the day, all tending to store the mind of the reader with information which (while being highly interesting) is of the highest order, such a journal is well

entitled to commendation and all possible support, as elevating the character of the British Press in an eminent degree. We are glad to find in the *Daily News*, to which paper we are alluding, the following which we quote in reference to these remarks, on what it terms "*a new way of estimating the motions of the* STARS!" which stars we were taught to believe in our earlier days, had no motion, being always considered as *fixed* in contradistinction to the planets of our system.

A remarkable paper has lately been sent to the Royal Society by Mr. Huggins, one of the fellows. It announces the application of a new and most promising method of inquiry to the determination of the stars' motions. Many of our readers are doubtless familiar with the fact that Sir W. Herschel was the first to point out the important results which may be gathered from the consideration of the stars' apparent motions on the celestial sphere. Just as a person travelling through a wood observes the trees in front of him to be opening out, while those behind him are closing in, and trees on either side of him apparently falling behind him, so, Herschel argued, if the solar system is really travelling in any direction through sidereal space, we ought to be able to detect a gradual opening out of the stars around that point towards which the sun is travelling, a corresponding closing in of the stars towards the opposite point, and a slow motion of all other stars from the former towards the latter point. He applied this principle to the examination of the motion of several stars, and obtained a result which has been confirmed by subsequent researches. He found that there is a certain point in the constellation Hercules towards which the sun, with all his attendant planets, is rushing with enormous velocity. Later astronomers have examined the motions of hundreds of stars in both hemispheres, and have proved beyond a doubt that the sun really has a motion in that direction. They have also determined the rate at which the sun is travelling, which appears to be somewhere about 150,000,000 miles per annum.

This result has been obtained simply by considering the apparent motions of the stars as interpreted by the principle which Sir W. Herschel laid down. The fact that the stars themselves are probably also in motion has not been left out of consideration; but it has been thought, and justly, that in the long run, when a sufficient number of stars have been observed, the effect due to their motion *inter se* will be eliminated, and may therefore be neglected throughout the inquiry. Were it not for this the inquiry would have seemed altogether hopeless.

But, returning to our illustration, the traveller through a wood has other means besides the one pointed out, of determining his rate of motion among the trees. For, as he draws nearer to a tree, he observes an increase in its apparent size, and in the clearness with which its various parts are seen. The same also is true of other objects in the wood; and if any of these be themselves in motion he is able to detect the fact, and to determine the nature of the motion, by noticing not merely their apparent change of place, but the variations which take place in their apparent magnitude and

distinctness. Now, the astronomer on earth seems to be wholly debarred from applying a method resembling the last to determine the nature of the stellar motions. The distances at which the stars are placed from us are so enormous, that no motion we could reasonably imagine them to have could appreciably affect their apparent brilliancy within hundreds or even thousands of years. Nor is this the only difficulty in the way of astronomers. If the stars shone always, or for very long periods, with uniform brilliancy, it might be possible for the astronomers of one age to judge of a star's motions by comparing their own estimate of its brilliancy with that formed by the astronomers of another age. But the stars are continually varying in brilliancy, some with a regular periodic change, others without any semblance of law, and this peculiarity renders it quite impossible to judge of their motions by means of any observed changes of brilliancy.

Therefore, it seems hopeless for astronomers to attempt to learn anything respecting stellar motions, beyond the mere fact that the sun is advancing towards a certain region of the sidereal heavens with an assigned velocity. Yet Mr. Huggins has succeeded in obtaining an answer to the very questions we have suggested above.

Many of our readers are doubtless aware that the solar spectrum is crossed by a multitude of dark lines. Now, what is the meaning of a dark line in the solar spectrum? We do not ask what is the physical interpretation of the phenomenon, that is, what evidence it gives us as to the sun's physical state—but what does the phenomenon signify in itself? The rainbow coloured spectrum signifies the presence in the solar light of light-waves of various length, from the longest rays, which produce red light, to the shortest, which produce violet light. If there were light-waves of every possible length between those limits, the solar spectrum could not fail to be perfectly continuous. But it is broken by dark lines. Hence it follows that each dark line signifies that light-waves of a certain definite length are wanting in the sun's light; a similar result holds, of course, in the case of a star.

Now, if a star is at rest—neither approaching the earth nor receding from it—it is perfectly clear that the waves of light which correspond to a given line (or, rather, since these waves are wanting, those which correspond to the part of the spectrum just above and just below the line) will have exactly the same position in the spectrum as the corresponding waves in the solar spectrum. So that, if it were possible to bring the sun's spectrum side by side with that of the star, this line in the sun's spectrum would be exactly on a level with the corresponding line in the star's. But if the star is speeding from or towards us, the waves of light will seem to be somewhat lengthened or shortened, precisely as the waves crossed by a stalwart swimmer seem broader or narrower according as he swims with or against their course. Hence, in this case, if the sun's spectrum and that of the star could be brought side by side, there would no longer be observed that exact coincidence which we described as resulting in the former case. If the star were very rapidly approaching us, the lines in its spectrum would be shifted towards the violet end of the spectrum, whereas if the star were

receding from us, the lines would be shifted towards the red end. The apparent change of place would be very minute indeed, because the rate of the star motion would be very minute in comparison with the enormous velocity of light. But still there would exist a possibility of so magnifying the change of place as to make it measurable.

Now we cannot bring the spectrum of a star side by side with that of the sun. But we can do what serves our purpose just as well—we can bring it side by side with the spectrum of some terrestrial element which is known to exhibit the particular line whose change of position we wish to measure.

This has been done by Mr. Huggins in the case of the star Sirius. The spectrum of this star is crossed by a multitude of dark lines, and, amongst others, by one known to correspond to a bright line seen in the spectrum of burning hydrogen. The two spectra were brought side by side, and due care having been taken to magnify as much as possible any discrepancy which might exist, it was found that the dark line in the spectrum of Sirius was not exactly opposite the bright line in the spectrum of hydrogen, but was slightly shifted towards the red end of the spectrum. It followed from the amount of the displacement, that at the time of observation Sirius was receding from the earth at the rate of about forty miles per second. When due account is taken of the earth's orbital motion at the time of observation, it results that Sirius is receding from the sun at the rate of about twenty-eight miles per second, or upwards of nine hundred millions of miles per annum.

The new method of examining the stellar motions is a most promising one. It will doubtless soon be extended to other stars. In fact, nothing but time and patience are required to enable astronomers to extend this method to all the visible stars, and even to many telescopic ones. For the latter purpose, however, an instrument of enormous light-gathering power will be required, and we hear with pleasure that Mr. Browning, F.R.A.S., the optician, is engaged in constructing a spectroscope to be used with the great six feet mirror of the Parsonstown reflector.

JAMES ISLANDS: *Pacific Ocean.*

The Arecifos or Providence Islands of the Chart.

CAPTAIN DANIEL SMITH has called our attention to the following article, taken from the *North China News*, published at Shanghai, and extensively copied into other papers, reporting the discovery of a group of Islands of which but little appears to be known. The Islands were first discovered in 1864, by Captain Samuel James, of the brig *Morning Star*. His report, as published in our paper, locates one of the atolls in North latitude 9° 52′, and East longitude 160° 56′. He also reported that it had the form of an irregular parallelogram, extending east by south and west by north twelve miles, by five in width, and

that there are in the atoll ten small Islands, the largest one on the east side. Two passages lead into the lagoon on the south shore, the best of which is about five miles from the east coast. It is the same group as was seen by the *Dundonald* three years later, as described below. If not heretofore named they should be called James' Islands, in honour of their discoverer:

The *Dundonald* left Sydney on the 29th of September, and on the 3rd of October made Norfolk Island, bearing E. by S. ten miles. From this date to the 8th instant had light N.N.E. wind, which drove the ship very far to the eastward. At six a.m. 24th, made the island Onalau (one of the Caroline Islands). At six p.m. took our departure from the Island, distance fifteen miles, and proceeded on our voyage to the N.W. with a fresh breeze from N.E. About ten a.m. on the 26th, when walking on the quarter-deck, was very much surprised to see land dipping on the horizon. At first I could not believe that it was land, as I knew if my reckoning was right that there was no land known to Europeans nearer than forty miles; but in half an hour the trees were distinctly visible. I therefore kept the ship direct for it, determined to satisfy myself as to its position, etc. At eleven a.m., four more islands appeared in sight, all covered with trees, and at noon I got a good observation and found my reckoning quite correct, so that these islands had not been discovered before. At one p.m., we came up to them, and the ship was then rounded to with the southernmost islands bearing north north-west, distance two miles. A boat was lowered and I proceeded toward the island accompanied by a Mr. M'Kay, passenger. After getting within a hundred yards of the shore our progress was suddenly stopped by an extensive reef. Up to this time we had seen no signs of life on the island. We then rowed around along the shore for about five miles, until we came to a break in the reef, and immediately pulled for it, but on getting closer to it, found there was no possibility of crossing, owing to the water being too shallow. We then discovered that the reef was a bed of red coral, completely surrounding the island, inside of which the water was apparently about six feet deep, and as smooth as a mirror. We then pulled for the next island, which was connected with the first by a coral reef, but the water did not break on it; and when about a mile from the second island, saw the masts of two canoes lying inside the island. Feeling quite satisfied that if those canoes could get in we also could do so, we pulled along the island for about two miles, and then found an opening in the reef through which we passed, and found ourselves in the centre of a beautiful lagoon with about fourteen feet of water, and the bottom perfectly clear, consisting of corals and other calcareous productions. We then went alongside of the canoes, but finding no natives in them, being immediately followed by the crew and Mr. M'Kay. As soon as the boat was made fast, we fired a few shots in the air, having taken the precaution to arm ourselves before leaving the ship, and proceeded to a large opening in the trees, keeping a sharp look out for any one that might be concealed in the bush. After walking about fifty yards inland, we came to a beautiful clear

space of about three hundred yards long, eighty or one hundred broad, of which we took a good survey before proceeding further; not thinking it judicious to go into the bush, as there was quite space enough for a large number of natives to be concealed in it. Cocoa-nut trees were in abundance, with plenty of nuts in immense clusters, and the ground was strewed with those that had dropped down from the trees. There were a great many more trees of different kinds, but we could not find any other fruit, though we found a large basket full of potatoes just dug, so that it would seem the natives had been disturbed by our firing when coming on shore. The basket was made out of the cocoa-nut leaf, and the potatoes were similar to ours, only very bitter in taste and very much like quinine. After spending about two hours looking over the island, we returned to the boat loading her with cocoa-nuts, and regretting very much that time would not allow us to take a further survey. Before getting into the boat the health of the Queen and Royal Family was drunk with all honours, and at the request of the crew and Mr. M'Kay, the islands were christened Kewley's Group, and the one I landed on Kewley's Island, as I was the first to land, and feel certain that I was the first white man that ever set his foot on it. We took each a little part of whatever we could get out of the canoes, to keep in remembrance of our visit, and the peculiar figurehead of the largest canoe is now on board of my ship. The position of the island is—southernmost islands, latitude 9° 47′ N., longitude 161° 15′ 45″ E. The group extends in an E. by S., and W. by N. direction for about thirty miles, but cannot say what their extent is north and south, as I had no time to explore them properly. The latitude and longitude may be relied on, as I only left the Island of Onalau two days before, and my instruments were quite correct then.

[We find the foregoing in the *Commercial Advertizer* of Honolulu. Having preserved the account with the view of examining it, we find the islands laid down in the Admiralty chart as "Arecifos or Providence Islands," discovered long ago: and we have accordingly appended their name to that given by the recent supposed discoverer. —Ed. *N.M.*]

Islands in the Pacific Ocean.

Positions of the Caroline Group.

Names.	Lat. N.	Long.E.	Authority.
Ualan, Kasaie or Strong's Island ..... centre	5° 19′	163° 06′	Lutke's Chart.
„ —Coquillo Harbour, N.E. isl.	5 21	163 01	Duperrey's Chart.
„ —Port Lollin, south, N.E. isl.	5 15	163 05	Lutke's Chart.
„ —Weather Harbour.....	5 19½	163 09	„ „ [1852
„ ..... centre	5 20	162 54	Sp. Ch. by D. F. Coello,
Pingelap Atoll or McAskill Islands ..... N. islet	6 13	160 47	Capt. Duperrey.

Names.		Lat. N.	Long. E.	Authority.
Pingelap Atoll or McAskill Islands	S. Islet	6 12	160 47½	Capt. Duperrey.
„ Atoll or McAskill Islands	centre	6 13½	160 48	Capt. Cheyne.
Tugulu Atoll or McAskill Islands	centre	6 13	160 50	Spanish Chart.
Mokil Atoll or Duperrey's Islands	NE.pt.	6 42	159 50	Duperrey.
„ Atoll or Duperrey's Islands	centre	6 40	159 49	Capt. Cheyne.
Aura Atoll or Duperrey's Islands	centre	6 40	159 47	Spanish Chart.
Ponapi, Quirosa or Ascension Isles, Ronkiti Harbour	...	6 48	158 19	Lutke's Chart.
„ Quirosa or Ascension Isles, Ronkiti Harbour	...	6 48	158 14	Capt. Cheyne.
„ Quirosa or Ascension Isles, Ronkiti Harbour	...	6 48	158 30	Av. ob. made by whaling captains.
„ Quiroso or Ascension Isles, Ponatik Harbour	...	6 48	158 30	Lutke's Chart.
Bonabe or Ascension Isle, Ronkiti Harbour	...	6 48	158 19	Spanish Chart.
Andema Atoll or Frazer Is.,	centre	6 42	158 05	„ „
Ant, Frazer's or William IV. group	N.E. part	6 42	158 03	Capt. Cheyne.
„ Frazer's or William IV. group	ext. S.	6 43½	158 05½	Lutke's Chart.
Pakin Atoll	centre	7 10	157 43	Capt. Cheyne.
„ Atoll	S.E. isl.	7 02	158 00½	Capt. Lutke.
„ Atoll	W. pt.	7 05	157 56½	„ „
Pagnema Atoll	centre	7 02	157 49	Spanish Chart.
Ngatik Atoll, Los Valientes	ext. E.	5 47½	157 32	Lutke in Findlay.
„ Atoll, Los Valientes	S.E. isl.	5 47	157 32	Lutke's Chart.
„ Atoll, Los Valientes	N. islet	5 51	157 29	„ „
„ Atoll, Los Valientes	W. islet	5 47	157 22	„ „
„ Atoll, Los Valientes	W. islet	5 40	157 14	Capt. Cheyne.
Ngaric Islands	centre	5 47	157 27	Spanish Chart.
Oraluk San Augustino and Baxo Trista, Bordelaise Island	centre	7 39	155 05	Findlay.
„ Jane Island	...	7 33	155 03	„
„ Larkin's Island	NE.pt.	7 36	155 10	„
„ Meaburn's Island	...	7 49	155 20	Norie's Chart.
Oraluk or San Augustin reef	S.E. end dangerous	7° 11′	156° 08′	Spanish Chart.*
„ or San Augustin reef	N.W. end dangerous	7 26	155 77	„ „ *
„ Bordelaise Island	N.W. end of reef	7 26	155 56	„ „ *
Dunkin's shoal (doubtful)	S. end	9 50	154 10	Findlay.
„ shoal (doubtful)	N. end	9 17	154 29	Spanish Chart.

* I think the Spanish Chart is the correct position of Bordelaise Island and Reef.

Names.		Lat. N.		Long. E.		Authority.
Nukuor Atoll, cr. monteverde Islands	centre	3	27	155	48	Findlay.
Dunkin's Island	centre	3	57	154	34	Capt. Aiken.
Nuguor Atoll	centre	3	50	154	56	Spanish Chart.
Sotoane or Mortlock Islds.	S. point	5	17	153	46	Lutke's Chart.
" or Mortlock Islds.	S.E. pt.	5	19	153	51	" "
" or Mortlock Islds.	W. pt.	5	27	153	36	" "
" or Mortlock Islds.	NW. ext	5	27	153	24	Capt. Cheyne.
" or Mortlock Islds.	...	5	08	153	38	" "
Lugunor Atoll	E. point	5	30	153	59	Lutke's Chart.
" Atoll	centre	5	39	153	32	Capt. Cheyne.
" Atoll	W. pt.	5	30	153	52	Lutke's Chart.
" Atoll	pt. Chamisso	5	29	153	38	Lutke in Findlay.
" Atoll, Etal Island	S. point	5	33	153	43	Lutke's Chart.
" Atoll, Etal Island	N. point	5	37	153	43	" "
" Atoll, Etal Island	N. end	5	35	153	41	Spanish Chart.
" Atoll, Etal Island	N.E. end	5	28	153	18	" "
" Atoll, Ta Island	S.E. end	5	16	153	51	" "
" Atoll, Ta Island	NW. end	5	30	153	34	" "
Namoluk Atoll or Skiddy's Group	N.W. islet	5	55	153	13½	Lutke in Findlay.
" Atoll	N.W. is.	5	55	153	17	Lutke's Chart.
" Atoll	centre	5	55	153	14	Spanish Chart.
Mokor or Hash Island (?)	centre	5	42	152	43?	Blunt's Chart.
Losap Atoll or D'Urville's Islands	centre	7	03	152	42	Duperrey in Findlay.
" Atoll or D'Urville's Islands	centre	7	05	152	37	D'Urville's Chart.
Rafael Island	centre	7	18	153	54	Raper.
Luasap Atoll or D'Urville's Islands	centre	6	50	152	39	Spanish Chart.
Truk or Hogoleu Islands and reefs	S. pt.	6	58	151	56	D'Urville's Chart.
" Hogoleu Islands and reefs	E. pt.	7	10	151	57	" "
" Hogoleu Islands and reefs	W. pt.	7	10	151	21	" "
" Hogoleu Islands and reefs	N. pt.	7	43	151	43	" "
Royalist Island	S. ext.	6	47	152	08	Capt. Cheyne.
Ruc Atoll or Bergh's Islands and reefs	S. pt.	6	57	151	54	Spanish Chart.
" Atoll or Bergh's Islands and reefs	N. pt.	7	43	151	39	" "
" Atoll or Bergh's Islands and reefs	W. pt.	7	20	151	19	" "
Morileu or Hall's Islands or Atoll	N.E. islet	8	42	152	26	Lutke's Chart.
" Hall's Islands or Atoll	S.W. islet	8	36	152	07	" "
" Hall's Islands or Atoll	N.E. end	8	42	152	29	Lutke in Findlay.
" Hall's Islands or Atoll	S.W. end	8	32	152	03	Spanish Chart.

The Floating Dock for Bermuda.

This huge structure, intended for Bermuda, was launched at North Woolwich, on Thursday, the 3rd of September, and was towed to Sheerness (arriving there on the following day) by eight steam tugs, accompanied by H.M. ships *Terrible* and *Medusa*, the latter leading as pilot. She was afterwards taken up the Medway as far as Salt-pan Reach, to moorings prepared for her, about 2½ miles above Sheerness yard. It is said that she is to remain there for the winter in order to be completed with her fittings, previous to being sent to Bermuda.

To enable the reader to form an idea of this huge fabric, the readiest description would be to say, imagine a ship (no matter her size) to be standing as she would, in a dock on her keel, inside of a huge hull, without masts, etc., of another ship, the sides of this hull being so far clear of the sides of the ship, as to admit of their being accessible for the shipwrights' work; also that the sides of the huge hull containing her are formed of two skins, some twenty feet apart from each other; and lastly, that the two ends of the hull, instead of being built with bow and stern like other ships, are left open, and each closed when required by means of a *caisson*, either of these *caissons* being removable at pleasure. The reader will then have mentally before him the floating dock, such as has been just launched for Bermuda. It may be very naturally asked, why could not a dock have been built at Bermuda, in the rocky character of the island? The direct answer is that, the nature of the rock, which is coralline, is so porous that it will not keep out the water, and consequently no dry dock could be formed there. Hence the construction of this huge, but most ingenious fabric, and how all the requisite conditions have been gained to secure the purpose for which she is intended will be seen by the following description, which appeared in the *Illustrated London News* of the 12th of September, along with two admirable drawings, which are far beyond the range of our small page.

The Board of Admiralty, having determined to provide this accommodation at Bermuda especially for the purpose of cleaning the bottoms of Her Majesty's ships in the West Indian squadron, engaged Messrs. Campbell, Johnson, and Co., of Silvertown, North Woolwich, to construct one larger than any previously made elsewhere. Its dimensions are 381 ft. in length, 123 ft. 9 in. in extreme breadth, and a total depth of 74 ft. 5 in.

At the distance of 24 ft. from each end of this floating dock caissons inclose a dock space of 333 ft. in length, by 83 ft. 9 in. in width, which will receive a vessel of 3000 tons.

The section of the dock is of a U form throughout, except at the extreme ends, where, for the convenience of towing, there is a slight taper or incline of the sides inwards.

The sides are formed of a cellular labyrinth of water-tight compartments 20 ft. in thickness between an inner and outer skin, intersected by "ribs," "stiffeners," and "girders," and forming a

huge mass of iron plating that is held together by three millions of rivets.

The sides of the whole dock consist of a cellular space of 20 ft. in width. Midway between the inner and outer skin is a water-tight bulkhead, running the whole length of the structure. Each side of the dock is subdivided by longtitudinal bulkheads into three compartments, named, respectively, from the bottom, the "*air*" chamber, the "*balance*" chamber, and the "*load*" chamber. These large main divisions are further subdivided by nine main ribs, extending from keel to gunwale, into twenty-four water-tight cells on each side. The dock is fitted with four steam engines and pumps on each side, which are employed to empty and fill, alternately, the load and air chambers.

The process of docking a ship may be thus described:—In the first place, the load chambers are pumped full, an operation which takes eight hours to complete; then the dock sinks below the level of the longitudinal bulkheads, separating the air and balance chambers. Valves in the outer skins of the balance chambers are then opened, and sufficient water is admitted to sink the dock, so as to receive any vessel that requires cleaning or repairs.

When the ship to be docked is floated in, the caissons are secured at each end, and the water is allowed to run out of the upper or load chambers. This, of course, allows the dock to rise, carrying with it the enclosed vessel.

When the dock is sufficiently high, valves are opened in the caissons, and in the balance chambers; all the water is run off, except so much as it may be necessary to retain in the balance chambers to keep the dock on an even keel. When floated as high as the weight of the vessel will allow, the dock is drained dry by opening valves in the inner skin, and allowing any water which may remain to run into the air chambers; an operation which, of course, does not alter the dock's displacement.

Then, when a ship is to be undocked, valves are opened in the outer skin of the balance chambers and in the caissons, when the huge structure gradually settles down until it sinks to the required depth. Then one of the caissons is removed, and the ship is towed out.

By filling the load chamber on one side only, the dock can be so inclined as to bring the opposite side out of water as far as the keel line, so as to effect the necessary cleansing and repairs. Several other floating docks have been constructed in this country, but they have been taken out in sections and put together where they are in use. In the present instance the dock is to be towed across in its finished state, and moored in the position it is to occupy inside the Breakwater at Bermuda.

The first attempt to launch this huge structure was made on the 2nd of September. A numerous company—amongst whom were Lord Henry Lennox, Viscount Curzon; the Hon. F. Stanley, the newly-appointed Lord of the Admiralty; Admiral Sir Alexander Milne; and Rear-Admiral Wellesley, Superintendent of Portsmouth

Dockyard—assembled to see the operation performed. The wife of Colonel Clarke, assisted by Miss Campbell, daughter of the builder, cut the cord suspending the weight which knocked away the dog-shores, and smashed a bottle of wine, suspended by ribbon, against the side of the floating dock; but the huge mass of iron remained stolidly unmoved.

Two powerful hydraulic presses commenced pumping; but the only response was a slight straining and cracking of the stout balks of timber, communicating their thrust to the "cradles." Gangs of men then improvised battering-rams of short lengths of square timber and cords, and tried to drive the great thing into the water; but no perceptible movement took place, and the *Bermuda*, 8350 tons of dead weight, remained in the same situation during half an hour of industrious effort to set her going. As a last resource, hundreds of shipwrights, working simultaneously, hammered wedges under the cradles, in the hope of giving her the little start that alone was required to send her gliding down the ways into the muddy waters of the Thames. As this effort was not productive of the desired effect, the proceedings had to be suspended.

The cause of the difficulty was the enormous pressure upon the ways. So great was it, that all atmospheric air was excluded from the interstices, and as a consequence this "dock," and the ways upon which she was placed, became as one solid mass. The problem was to produce mobility in the grease by the admission of air. To effect this, previously to the second attempt, on the following day, notches were cut at intervals in the planks which bound the "ways" on each side; the grease, with long probes, was pushed in through the openings thus made, and fresh oil was squirted in with syringes. A separation was thus effected, and all that then remained to be done was to give the huge mass of nearly 10,000 tons of iron its initial push. A consultation was held in the yard, at which were present Messrs. Barnes, Warren, and Crossland, from the Admiralty, and Mr. Lumley, a Thames shipbuilder of great experience; and, in obedience to the recommendation of those gentlemen, upwards of sixty "shores" were placed against the bilge of the vessel on her inner side, and at the bottom of these shores were placed wedges, which were driven in by the united force of a thousand men. In addition, the services of eleven hydraulic "jacks" were employed; and the application of all this force—supplementing the previous ventilation and lubrication of the ways—sent the great vessel in about half a minute into the river; and in a few minutes afterwards she was under full way, bound for Sheerness.

It is said that this very ingenious contrivance is constructed from a design of Mr. Campbell, the principal partner in the firm above-mentioned, at Woolwich. And also that previous to her departure for Bermuda, she is to be placed in the refuge harbour at Portland, when one of the ships of the Channel Squadron is to be docked, as a kind of experimental proof of her powers of performing her work when she is at Bermuda.

Nautical Notices.

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

Particulars of Lights Recently Established.

(Continued from page 517.)

Name.	Place.	Position.	F. or R.	Ht. in Ft.	Dist seen Mls	[Remarks, etc. Bearings Magnetic.]
81. Tavolara Is.	Sardinia East Coast	40° 55′ N. 9° 44·7′ E.	F.fl.	540	30	Est. 1st September, 1868. Flash once a minute.
82. Sprogo Is.	Great Belt	55° 19·8′ N. 10° 58·4′ E.	R.	134	17	Est. 1st September, 1868. Period of revolution two minutes.
83. Adour River	Close to S. jetty	43° 31·8′ N. 1° 31·4′ W.	F.	56	7	Est. 15th August, 1868. Variable See Note 83.
Brest, 2 lights	On jetties of Port	At West Entrance	F.	33	7	Est. 15th September, 1868. Red.
Belle Isle	North Point	Point Poulains	Fl.	112	14	Ditto, ditto. Intervals of light and eclipse five seconds each, alternately. See also Note 83*a*.
84. Coquimbo	Coast of Chili	Tortuga Point	Fl.	106	12	Est. ? See Note No. 84.
Magellan St.	Sandy Point	Not said	F.	19	...	Est. 24th May, 1868. See Note 84*a*.
85. Bercks	Point Haut Banc	50° 24′ N. 1° 35·5′ E.	R.	115	14	Est. 15th September, 1868. Visible and eclipsed alternately every six seconds.
86. Yang-tse-Kiang	Entrance	China Coast	R.	38	12	Est. 18th July, 1868. Greatest brilliancy every twenty seconds. Light vessel. See Note 86.
87. Broken Bay	Barrenjuey Head	N.S. Wales	F.	347	12	Est. 20th July, 1868. Two lights 390 yards apart, E.S.E. and W.N.W. See Note 87.
Port Philip	Nicholson Knoll	Victoria	...	...	...	Second buoy chequered black and white. See Note 87*a*.
Tipara Shoal	Spencer's Gulf	Australia	F.	...	...	Light Vessel to be changed in January next.
88. Rossbeg Bank	Dublin Bay	S.E. edge	...	...	...	Buoy. See Note 88.

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

No. 83.—The light is a *fixed white* light when the passage is considered practicable, and a *fixed red* light when the state of the sea will not permit vessels to enter by night.

When the white light is shown and the passage practicable, two *green* lights will be exhibited, which, kept in line, will lead in the direction of the channel between the jetties.

No. 83*a*.—The light is a *flashing* white light, showing the light and eclipse alternately for five seconds, elevated 112 feet above high water, and in clear weather should be seen from a distance of 14 miles.

This light, which appears to be a revolving light with equal intervals of light and darkness, when in line with that of Belle Isle (which revolves every minute), leads about three quarters of a mile to the Eastward of the Plateau des Birvideaux.

No. 84.—The Notice says, "The light is a *flashing* white light showing a flash of *five seconds* duration every *fifteen seconds*, the partial eclipse lasting *ten seconds*." But as we do not see how a flash can last even for five seconds, we look on it as a revolving light; the intervals of light and darkness being modified;—the former lasting five seconds, in which interval the light increases to and decreases from a strong glare, and in the latter interval of ten seconds of darkness, a faint light is still visible.

From the lighthouse Pajaros Islands bear N.W. ¼ N., outside rock (one mile distant) N.W. ⅝ W., Ninos rocks W. by N. northerly, outside Point S.S.W. ¼ W.

No. 84*a*.—The lights are *fixed*, one *red* and the other *green*; they are placed at high water mark, elevated 19 feet, and bear from each other N.E. and S.W., distant 22 yards.

All Bearings are Magnetic. *Variation at Coquimbo* 15½° *Easterly in* 1868.
,, *Sandy Point* 22° ,, ,,

No. 86.—The vessel is painted red, and has one mast surmounted with a ball; a gun is fired to attract attention when a ship is observed running into danger, and the signal, by Marryat's Code, of the course that should be steered is then exhibited. In thick or foggy weather the fog-bell (worked by clock-work) is sounded every *sixteen seconds*, and can be heard in calm weather at a distance of 2 miles.

No. 87.—Both lights will be eclipsed from seaward between the bearings North to N.N.W. ½ W., to prevent them from being seen over the land, which recedes from the outer south head, and also to ensure a vessel passing a safe distance off the south head by keeping the lights in sight when running for Broken bay.

The lower or outer light will be lost sight of in rounding Barrenjuey, but the upper light will be a good guide for coasters bound to Pitt water, or for large vessels wishing to obtain shelter in Flint and Steel Bay.

No. 87*a*.—The Colonial Government of Victoria has given notice, that in consequence of the bank known as Nicholson's Knoll, having extended in a southerly direction, a second buoy, *chequered black* and *white*, has been moored to mark its southern extremity.

The distance between the two buoys is about one and a half cables, and there is an average depth of not less than nineteen feet between them.

No. 88.—The buoy is a *red conical* buoy, with the words *Rossbeg Bank* in white on it; it lies in five fathoms at low water springs, with the following marks, bearings, and distances, viz.:—

Sutton Martella tower, just open of Sheepnole Point, N.W. by W. ¾ W. Tower on Dalkey Island on with the little Sugar-loaf, S.W. by S. Baily Lighthouse, N.E. ½ E. 8½ cables. Poolbeg Lighthouse, W. by N. ¾ N. 3½ miles.

All Bearings are Magnetic. *Variation* 24° *Westerly in* 1868.

To the Editor of the Nautical Magazine.

SIR,—I trust you will permit a very old correspondent of the *Nautical* to make a few remarks on the subject of life buoys at sea.

They say that good wine needs no bush, but don't let one who wants to taste it, have the cup (or I should in these days say "glass") dashed from his lips.

Now this did happen to me a few days since, and all because, like many of the world, I have the habit of thinking that most men mean what they say when they talk publicly about the private affairs of others. It is really dangerous to believe any landsman who publishes about sea affairs. There was to be in one of our Royal Dockyards an exhibition of a life buoy for preserving life at sea, and I don't know who wasn't to be there, a few days since. I could not go—but next day the half drowning of sundry riggers and other volunteers was to exhibit in stronger colours the value of this good life buoy.

Of course an old sailor is like an old coachman, he dearly loves the smack of the whip, and so off I went to the dockyard, but just as I was leaving my inn, I saw a paragraph in a local paper which professed to detail the exhibition of the previous day. After reading it—Well, said I to myself! pretty sort of inventors Messrs. Welsh and Bourchier must be, whoever they may be!—"a life buoy three feet six inches square at bottom, and about *three feet six inches high*, with air-tight compartments at *the bottom* to cause buoyancy!"—Catch me there! said I, glowing with self respect. But, sir, old people do sometimes benefit from second thought—(perhaps pains in my game leg had some influence on my first resolution)—and I encouraged these second thoughts. I don't care much about sights, but upon my word, sir, the bare novelty of such an absurdity as a life buoy intended for the trembling ocean surface, and with a height of three feet six inches, with all its means of buoyancy placed at the bottom of it,—(that is, below the centre of gravity)—WAS a thing which excited my curiosity, and I ventured, half ashamed to be among the spectators!

But what did I see? really a clever and ingenious—(well, but never mind that)—I should rather say a great improvement on our present stern life buoy. It is too bad, however, that the lordly "press" should so carelessly trifle with the interests of inventors and the public, even in what a landsman may call a minor matter. This is not a trifling matter, but I acquit the local editor of any unfriendly intention towards the patentees. I find these gentlemen, the inventors, are greatly experienced naval officers, they have evidently spent a great deal of money over this invention, and I heard several naval men at the exhibition in the dock wish them success, I do myself, and so do you;—the *Nautical* is always open to seamen's interest!

If particulars of this new life buoy for sea service have not yet reached you, I shall be most happy to communicate them with a few independent remarks, having thoroughly examined the model, but am afraid I cannot save time for insertion in this number.

I beg to enclose my card, and have, etc.,

September 15th, 1868. HOLYSTONE EYE.

In reference to the foregoing, we find this notice in the *Hants. Telegraph*.—At the same time our "old" friend may favour us with something about it not noted herein.—"By direction of the Admiralty a trial has been made in the Medway of a new description of life buoy, patented by Messrs. Welsh and Bourchier, which it is proposed to adopt in the Royal Navy. It consists of a light, open framework of wood, at the upper end of which is a metal air casing, and at the lower part a small water tank, capable of containing about six gallons of fresh water. Two telescopic masts are also fitted to the life buoy, having at their summit two flags always flying seven feet above the level of the sea, for the purpose of pointing out its position from the ship. To these masts are attached two port fires as signal lights, one being ignited by the action of letting go the buoy, while the other is at the service of the man when he gets into the buoy, to show his position in a dark night. The buoy will support a whole boat's crew by their holding on to the floating brackets outside. The trial was made from the stern of the *Salamander*, and the result was highly satisfactory."

NOTES OF NOVELTIES.

AMONG the passing events of the day is one which it is to be hoped will obtain attention in the proper quarter. It is no doubt no novelty in reference to the merchant ships. The practice of using short bolts has been exposed in this journal years ago,—but it is a novelty for such things to be found in H.M. ships, and now that contract building is assuming so large proportions from the inability of working iron in H.M. yards, the practice of employing short bolts has begun to shew itself to open daylight.

We read in the Mechanics' Magazine of September 4th, that "the method adopted to render ships of war built in private yards at a less cost than those built by Government has been *exposed* in breaking up the *Sepoy* at Devonport dockyard. In opening this vessel it was found that the *copper* bolts were what are technically called '*Dummies*,' that is, were of *short lengths*, scarcely holding the timbers together. In these there were about 900 pounds of copper, instead of over two tons (*i.e.* 4480 pounds, from which deducting 900 pounds as found, leaves 3580 pounds as the quantity saved or pocketed by the builder!) which two tons would have been their weight *if of proper length*. A strict enquiry it is said, will be made into this matter with a view to the exposure of the contractor's name and the punishment of the *inspector* who superintended on the part of the public service the building of this vessel." The above would be no bad saving to be added to the profits of the contract!

It will be seen that the name of the vessel, "*Sepoy*," does not appear on the *present* Navy list—but it will be found on some of no distant date, where she figures as a tender to H.M. Ship *Dauntless* at Hull! Such are among the blessings with which England's Navy is to be sent to sea, when her ships are built in *some* PRIVATE *yards*.

CAUTION:—YACHTS FLYING UNAUTHORIZED COLOURS OR PENDANTS.

THE following circular has been addressed by the Admiralty to the Secretaries of Yacht Clubs:

"Admiralty, Sept. 8th.

"Sir,—It having come to the knowledge of my Lords Commissioners of the Admiralty that some yacht owners are in the habit of flying the colours of the clubs to which they belong without having obtained the proper warrants from this office; also, that in the case of yachts belonging to more than one club, it is supposed that the owner need only take out a warrant for one of the clubs to which he belongs, I am commanded by their lordships to acquaint you that they must request that yacht owners will at once apply for warrants to fly the colours of every club to which they belong. I am also to request that you will call the attention of the members of the club to the 105th section of the Merchant Shipping Act, which is as follows, viz.:—'If any colours usually worn by Her Majesty's ships, or any colours resembling those of Her Majesty, or any distinctive national colours except the red ensign usually worn by merchant ships, or except the Union Jack with a white border, or if the pendant usually carried by Her Majesty's ships, or any pendant in any wise resembling such pendant are or is hoisted on board any ships or boats belonging to any subject of Her Majesty without warrant for so doing from Her Majesty or from the Admiralty, the master of the ship or boat, or the owner thereof, if on board the same, and every other person hoisting or joining, or assisting in hoisting the same, shall for every such offence incur a penalty not exceeding £500, and it shall be lawful for any officer on full pay in the military or naval service of Her Majesty, or any British officer of the Customs or any British consular officer to board any such ship or boat, and to take away any such jack, colours, or pendant, and such jack, colours, or pendant shall be forfeited to Her Majesty.' I am also to request that you will send annually to this office a list of the yachts belonging to the club, and that it may be compared with the register of warrants in force.

"I am, Sir, your obedient servant,

"HENRY G. LENNOX.

"To the Secretary of the——Yacht Club."

WE are glad to find that the large iron dock intended for Bermuda has been successfully launched, and is to be navigated to her destination by a party of fifty seamen, four warrant officers, two navigating sub-lieutenants, and one assistant paymaster, selected from H.M.S. *Fisgard*.

WHILE we congratulate our neighbours on the completion and opening of their new dock at Boulogne we learn with concern that our splendid harbour at Bombay is silting up. Happily it is a capacious one with abundance of deep water, and we have no doubt that the judicious and active measures to be adopted will prove a remedy. Of

Boulogne we read that the formal opening of the grand docks took place on the 18th of August, when the Imperial yacht, having on board Prince Napoleon, steamed up the harbour, and entering the lock gates bore up for the east quay, where she was made fast. There was a great crowd, chiefly English visitors, collected on the pier heads and quay to witness the opening, who, seeing the Prince on the bridge of the yacht, loudly cheered him. The dock was commenced in the year 1859, and has thus been nine years in course of construction. The total cost has been a little under £300,000. The space it occupies is on the west side of Boulogne harbour, at Cape Cure. The basin for shipping occupies an area of more than seventeen acres, with a quay wall frontage of 3,600 feet and a quay space of over 240,000 square feet for the stowage of goods. It is of irregular shape, and about 1,300 feet in greatest length and 630 feet in greatest breadth. The lock or half-tide basin is 325 feet in length and 68 feet in breadth, with a depth over the cill of the gates of 29 feet at high-water spring tides and 23 feet at high-water neap tides. But the facility of entering it is measured, not by its own depth, but by that of the channel leading to it over the bar of Boulogne harbour. This is stated by the most recent measurements to be about 24½ feet at high-water spring tides, and 19 feet at high-water neap tides. From these figures about 3 feet must be deducted for the fall of the waves, the allowance to be made for not following the exact channel and other cases, and finally the maritime authorities of Boulogne declare the harbour to be easily accessible, under all circumstances, to vessels drawing 21½ feet water at high-water spring tides, and 16 feet at high-water neap tides.

That sharks roam about the Mediterranean is to be expected, and that they are just as voracious there as in the waters of the ocean, is confirmed by the following, which we insert to place bathers on their guard:—The authorities of Trieste have issued a notice warning all persons to be careful as to where they bathe, as at this moment there is a large shark in the bay. One man has already been bitten. He was swimming close to a bathing establishment when he was seized by the thigh. He cried out, and a rope was thrown to him, but before he could be pulled from the water the voracious fish again made an attack on him, breaking his leg below the knee. He was conveyed to the hospital, but fears are entertained that the limb will have to be amputated.

An important inquiry under the Passengers' Act has been held at the Mansion House, in reference to passengers at sea. The captain of the *Vimiera*, an Austrian passenger ship, which lately arrived in London from Melbourne, was summoned for having had the vessel deficient in closet accommodation, and for having served out flour during the passage which was not in good condition. The complainants under each head were a number of third-class passengers. The first charge was dismissed, but the second was declared proved, and the defendant was fined £25. We fear that there is too much inattention sometimes even to the first of these subjects.

THE brig *Brewster*, at San Francisco from Portland, experienced an earthquake at sea on the 18th May, in latitude 44° 7′ north, longitude 139° 7′ west, which threw the men off their feet on deck and out of berths below. A second shock followed a few seconds after.

EXTRAORDINARY TIDE.—On the 15th of August a singular tidal phenomenon occurred off San Pedro, Southern California. A series of waves commenced flowing upon the coast, causing the tide to rise sixty-three or sixty-four feet above the ordinary high-water mark, which was followed by the falling of the tide an equal distance below the usual low-water mark. The rise and fall occurred regularly every half hour for several hours, causing considerable alarm among the inhabitants along the coast in that vicinity. The phenomenon is attributed to some submarine disturbance.

THE severe earthquakes of the Sandwich Islands, the account of which is concluded in this number, seem to be in connection with the above, shewing that the action had a N.E. direction. They were experienced at San Francisco on the 26th May. Another seems also to have been experienced at Paramatta (Australia) on the 2nd of June.

This enormous volcanic action, which devastated a large portion of the island of Owhyhee in April, reached the coast of Peru in August following, swallowing up several towns, among which is Arica, and inundating Callao with waves fifty feet, it is said, above the sea level. It is also said that two of the United States' ships of war were totally wrecked on the coast of Peru.

WE perceive by the minutes of the Life-boat Institution of the 3rd of September, that the Society's boats have been vigorously employed on various parts of the coast that are denied the advantage of Refuge harbours, and that payments amounting to above £500, were ordered to be made to various Life-boat Establishments during the month of August.

A LITTLE set of tables has been drawn up by Mr. R. C. Carrington, of the Hydrographic Office (Admiralty), shewing the length of the degree, minute, and second throughout the quadrant in English feet. The length of the degree of latitude is given in English statute miles (as invariable), and the length of the degree of longitude in minutes of latitude or nautic miles. We perceive the calculations are founded on data from the Ordnance Map Office. It is a useful compilation, and published by Potter, the Admiralty publisher.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, *in September*, 1868.—*Sold by the Agent, J. D. Potter*, 31, *Poultry, and* 11, *King Street, Tower Hill, London.*

2056 DEm = 0·3. Eastern Archipelago, Sunda Strait and its approaches, with eight Plans and Views, English and Dutch Surveys, 1867. 2s. 6d.

EDWARD DUNSTERVILLE, *Commander, R.N.*
Admiralty, Hydrographic Office, 21st September, 1868.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

NOVEMBER, 1868.

Progress of the Wolf Rock Lighthouse.

The history of the lighthouse in course of construction on the Wolf Rock, with the preliminary works before it was decided on, would form a curious compilation highly illustrative of the pains and expense which are incurred for the safe navigation of our shores. The Wolf was always a serious danger to navigation. It occupies a position midway between Scilly and the Land's End, ready to intercept and cause the destruction of vessels using that channel. In earlier days of the present century a buoy was placed on it by the Trinity House; but in such a turbulent position as it occupies, no sooner placed (it might be said) than it was washed away, causing a continual replacing of the buoy, and this being likely to become perpetual, as no such means could ever be depended on as being effectual, a beacon on the rock itself is next constructed. This however seems to have had as little chance of enduring as the buoy, till at length to make the rock the site of a lighthouse was resolved on, as the only means of perpetually rendering such an insidious danger as a rock awash with the surface of the sea, a useful conspicuous object. There are noble works of this kind, such as the Eddystone, a brother danger, the Bell Rock, the Skerryvore, and the Bishop Rock, the outer of the Scillys—these are all instances of the skill of the engineer in robbing these seamen's enemies of their dangerous character, by making their hidden parts themselves the foundations of safety beacons to navigation, inasmuch as they all proclaim, even in darkness, by a well finished light, a friendly warning to the navigator, that is repeated in the light of day by a stately tower. Thus, like the deadly poison, so the fatal rock, when judiciously used, makes that operate for the preservation of human life which in another way proves its destruction.

Besides former references to the "Wolf" in our note,* one of the earliest notices of the proposed lighthouse in this journal is quoted here, for our volumes become scarce as they are disseminated, it will shew that the particulars, as they are therein stated, have been carried out as far as the work has yet progressed.

"Midway between the Lizard Point and the Scilly Islands, at a distance of about twenty-two miles from each, lies a dangerous rock called the Wolf. It is about fifty-eight yards long, and thirty-eight broad at low water; bold, and steep to, on all sides. The set of the tides in the locality varies towards every point of the compass in the course of twelve hours; ordinary springs run very rapidly, and during S.W. gales and stormy weather there are furious eddies making it very hazardous to approach within a considerable distance of the rock; the rise of tides at such times is also full ten feet above the ordinary springs. The sea roars terrifically, as with the full force of the swell of the Atlantic, it precipitates itself against the rock. In calm weather the noise is heard at a great distance.

"It will be easily imagined that this rock is very difficult of access, except in very fine weather. It was only after long, patient, and persevering toil, that the attendant difficulties were surmounted about twenty years ago, and a beacon was completed, having the centre of its globe twenty-four feet above the level of the sea at high water. Portions of the wrecks of several vessels jammed into the interstices of the rock were discovered, and told a fearful tale of the loss of life and property on this treacherous rock.

"It was found that the beacon was so frequently buried in the waves, that to make it effective it would be necessary to give it greater elevation. In 1848, the stone beacon was cased outside with thick iron plates (perforated) and a new iron mast and globe erected, with the centre ten feet higher than the former one. The total cost incurred in the erection of this beacon, with the last improvements, was £11,298 4s. 1d.

"It has long been desired that a lighthouse should be substituted for the beacon, and in the course of last autumn steps were taken by the Trinity Corporation for commencing operations on the Wolf. The premises of Messrs. Belitho, at Penzance, being found suitable for a building yard, and furnished with all other necessary accommodation,

* REFERENCES TO NOTICES OF THE WOLF IN THIS JOURNAL.

1839—P. 495. Beacon above high water mark.
1840—P. 599. The beacon (a cone 18ft. at base), with a ball 6ft. in diameter on a mast 46ft. above the rock completed.
1842—P. 647. The poles and ball of the beacon that had been washed away in 1840, replaced.
1848—P. 203. Mast and ball again washed away.
1862—P. 260. In 1848 beacon had been cased with iron, new iron mast erected 10ft. higher. Whole cost incurred, above eleven thousand pounds. Lighthouse projected.
1866—P. 449. Progress of the lighthouse. A highly interesting account of a visit by Commander E. H. Seymour, R.N.

were rented, and shortly afterwards Mr. W. Douglas commenced his new undertaking. Owing to a long prevalence of weather unsuitable for working on the rock, the principal operations have hitherto been preparatory; but as summer comes on the work will be prosecuted with that energy and sagacity for which the family, who have for many years been employed in the erection of rock lighthouses. are eminently distinguished.

"The diameter of the base will be 40ft., over nine-tenths of this space the rock has to be squared down to 3ft. 6in. below the level of the upper point of the rock, and over the remaining tenth of the diameter 1ft. 6in. deeper, so that the lower courses will be built 5ft. into the solid rock, and 16ft. below the level of high water springs. The first nineteen courses bringing the tower up to 38ft. from the base, will be of solid granite, the diameter of each succeeding course being reduced by nine inches, that of the tower at the above elevation is reduced to 25ft. at this level, and on the south-east side of the tower will be the entrance door, made of strong metal, and fitting so exactly, as to be perfectly impervious to water, and capable of resisting the utmost impetuosity of the waves. The ascent to the door is by thirty-six metal steps, built in with the solid granite. From the level of this entrance door a circular staircase, cleft out of the centre of the solid, leads to the water-room, the floor of which forms a landing place for the stores. The thickness of the walls of the six rooms above the said staircase gradually decreases from 6ft. to 2ft., the height of each room being 10ft., with each stone floor forming an arch over-head, and 9in. thick, all granite.

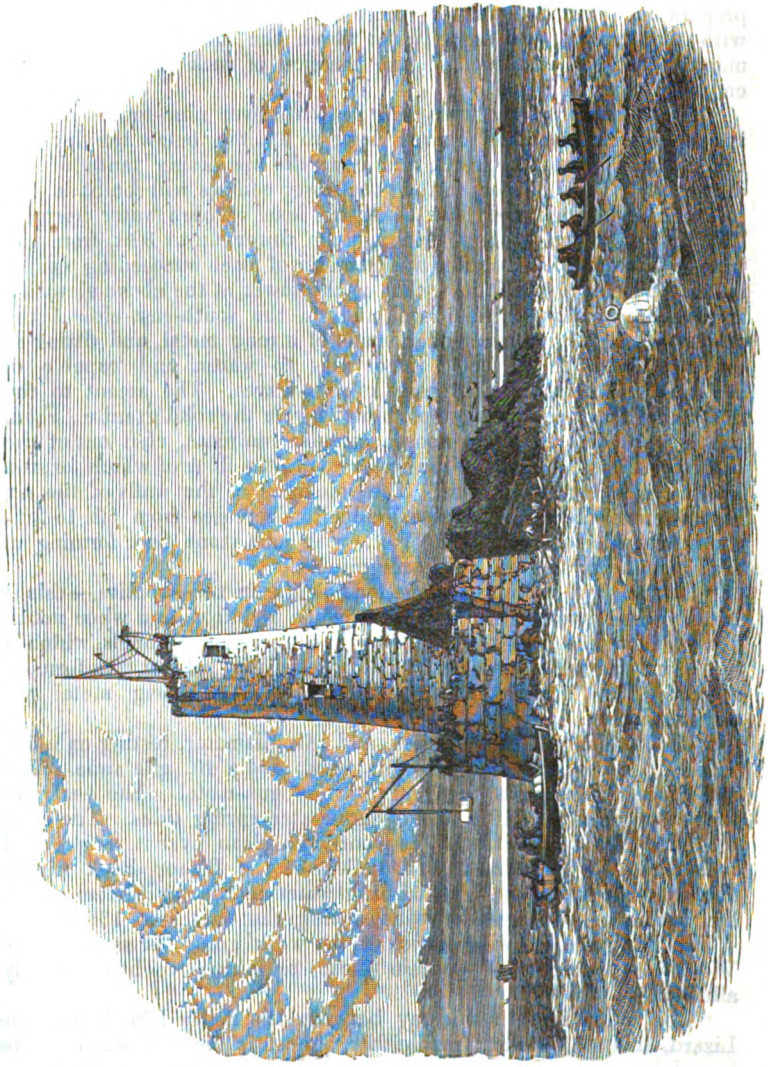
"In the store-room is a crane for hoisting in the supplies,—this is ingeniously contrived—to launch out when required, and when not in use it is completely housed, leaving the aperture, through which it slides, impenetrable by water. The parapet will project 2ft., forming a gallery 3ft. 6in. round the lantern, with a strong metal rail surrounding it.

"The lantern will be 19ft. high, and 14ft. diameter, resting on a 5ft. pedestal, and surmounted by a 5ft. cowl, and a 4ft. gilt vane. The roof and frame work of the lantern are of gun-metal. The centre of the lantern is to be 110ft. above high-water spring tides. The crest of the waves, however, will frequently go clean over it, as proof of which, the fog bell affixed to the gallery of the Bishop Rock Lighthouse, 100ft. above the level of high-water mark, was broken off by the sea in a heavy gale of wind, during the winter of 1860."

We find the following notice of the work going forward on the Wolf, in the report of Captain Close, to which we have already alluded:—

"The Wolf Rock is midway between the Scilly Islands and the Lizard, about 22½ miles from either, almost in the fair way of ships bound from Channel either to the west coast of England, to Ireland, or Scotland. It is submerged at high tide, and, owing to there being deep water all round it, the hand-lead gives no warning of its proximity. From time immemorial, therefore, it has been a terror to

navigators bound to any of the above-named destinations, and still more so to inward-bound ships, which in the dark and stormy winter



months have not been able to correct their reckoning by observation of sun or stars. In the earlier days of engineering science the impracticability of placing a lighthouse on it, owing to its exposed

position, its great distance from land, and, above all, to the heavy sea which at all times breaks over it, appeared to be insurmountable. In 1840, however, the lighthouse authorities determined to try and place a beacon on it, which, after various failures, was accomplished at an outlay of £10,000, after seven years of danger and disappointment to the builders. This beacon, however, could only be seen by day, and the terrors of the Wolf during dark and stormy nights remained undiminished. When the eminent engineers, Messrs. Walker and Burgess, had succeeded, in 1858, in crowning the Bishop Rocks, which lie to the S.W. of the Scilly Islands, and on which Sir Cloudesley Shovel and his fleet suffered shipwreck in 1707. With a lighthouse, the greatest triumph of engineering skill extant, the Trinity House authorities applied for the Government sanction to erect a lighthouse on the "Wolf," which was unhesitatingly granted, and the first stone of the building shown in the illustration was laid by their engineer, Mr. W. Douglas, on August 6th, 1864; since which, through his indefatigable energy, and after the frequent destruction in a few minutes of the work of days, the lighthouse has in the course of three summers attained the height shown in the sketch, a progress so unexpected that the authorities hope to exhibit the light from it in the course of a couple more years. The light, which will be a powerful first-order dioptric one, showing entirely round the horizon at a height of 110ft. above high water, will not merely warn ships off the rock, but will act as a point of departure and a landfall for both outward and inward bound ships; for, standing as it does, out in the midst of the ocean, navigators will not hesitate approaching close, though at present they give so wide a berth to the Wolf Rock."

With the foregoing, and the interesting account in our volume for 1866, from Commander Seymour, R.N., and the annexed sketch of Captain H. B. Bax, the reader will be in possession of the progress made in the construction of the light on the Wolf Rock, shewing the condition of the building in July last, when it was nearly 90ft. above the sea, requiring about 20ft. more height, the stone work of which would be finished in the present year, the weather having been of late so favourable. It appears that thirty workmen are attended by two heavy barges for transporting the ready formed blocks from the shore, accompanied by a steamer and schooner.

The Anchor Question and Admiralty Contractors.

The spirit of economy is again roused from its dormitory, and at the present critical junction of political matters is made a powerful and no less reasonable fulcrum for the displacement of those who are not overcareful of its meaning. Without harbouring the slightest ob-

jections to Mr. Seely's searching investigations, there are collateral conditions which are inseparable from some of those conclusions that have been arrived at that seem to shew a total want of respect for economy. Mr. Seely is no nautical man, no more than the editor of a Daily journal, and it would have materially strengthened the opinions advanced sometimes by these gentlemen, if their conclusions on the subject of expenditure in nautical matters had been refined with a mixture of nautical experience.

We will take the subject of contracts—that is work contracted to be performed by owners of private dockyards or others for those of the Government. It is an old time honoured principle in these matters, which are agreed on by *tender*, for the Government to follow the very questionable system of taking the *lowest* offer. It is one which is no doubt founded on the evident principle of a fair return for *honest* labour, or *bona fide* material employed. But how does the adoption of the principle itself work. It is not so very long ago as to be beyond the memory of the present generation to remember the outcry against the contractors who supplied the preserved provisions in tin cases found on those northern shores, where the unfortunate Franklin had passed. And since those days a greater outcry still has been raised against the man who supplied meat in tin cases for the use of the navy, which cases, on being opened in the Black Sea, were found to contain, instead of good honest meat, a collection of such offal material that was not even eatable. Here are specimens of the kind of *bona fide* material to be expected from unprincipled contractors in goods supplied under a seal necessary for their preservation.

Now there can be no doubt that these contracts were taken on the principle of the *lowest* offer, and that that offer might have been backed by the contractor having the advantage of obtaining his meat at a cheap market abroad, that he was thus enabled to reduce his tender to a minimum far below all others. But the lesson was sufficient, and it is said that the result was that the Government determined to be no longer subject to such dishonest proceedings, and established at Deptford their own preserving process, determined very wisely to see if they could not provide their own preserved meat for the navy as cheaply as any contractor would pretend to supply it: and no doubt they have done so, although Deptford as a *ship building* yard has ceased to be.

Another article for which the Government has had recourse to contractors, is that most important one of the ship's anchor. And here, too, the cry of economy is rampant, condemning without mercy the proceedings of the Government. Indeed, one of our Daily papers has shown what is considered such a thorough *exposé* of the Admiralty System, that it is worth while to consider it. We shall then see what little nautical experience has to do with it, and may wonder how such a conclusion can be upheld in these days. Here, indeed, Mr. Seely sadly wanted the assistance of a nautical man.

The journal in question speaks thus on the subject, after alluding to the difficulty Mr. Seely's Committee had of gaining information con-

cerning its enquiries, without for a moment considering the *capabilities* of civilians in office: whether they were really able to afford the information required. Reticence and reserve might characterize the responses of the higher individuals,—but were they really capable of affording the information asked for. Yes, officials were perhaps stubborn in their replies, but was that stubbornness used for the purpose of concealing their own ignorance or for thwarting the objects of the Committee? In honest charity it must be admitted to the category of the former, and if we do err in placing them there, our motives will at least claim for us impartiality;—however large is the conclusion in question. The journal alluded to says:—

"It would be impossible to attempt to analyse the whole evidence; but, as specimens of the disclosures it unfolds, we will take two examples: First we will take the question of anchors and then of shipbuilding. The first is important because it involves the whole question of contracts entered into by the government. As regards anchors, then, it appeared from Mr. Seely's statement that the Admiralty had entered in 1842 into a contract for anchors with Messrs. Brown, Lennox, and Co., which had remained undisturbed up to the present time, and had, therefore existed for more than a quarter of a century. This was remarkable enough considering that, as a rule, contracts are never allowed to stand over for more than five or six years at the most. It was more remarkable when it appeared that, not only was this contract allowed to remain unchecked for this period, but that during the Russian war the price paid by the Admiralty to this company for anchors was raised to an extraordinary sum, and exceeded the current price for anchors more than four times the weight of those bought by the Admiralty. Thus, in 1857 and 1858, the Admiralty paid forty shillings for anchors uuder 20 cwt., while the current price among first-class firms for anchors of 100 cwt. was thirty shillings in 1858, and thirty-one shillings and threepence in 1857. Now for the evidence on this point. The Storekeeper-General was examined, and his apology for the Admiralty was (question 502), "that the board agreed to make an allowance for special orders; and in order to be sure that they could get what they wanted, they agreed to allow that price (forty shillings), as a special arrangement under the circumstances of the outbreak and continuance of the Russian war."

"This was fair enough, supposing no other anchors could have been procured. But Mr. Trotman, whose anchors have a world-wide fame, tells the committee that Messrs. Hawkes, Crawshay, and Co., raised the price of such anchors from nineteen shillings to twenty-one shillings, in consequence of the Russian war, and shows that twenty-four shillings was not only an excessive price, but that, according to a printed return of the contract prices of anchors in 1858, they had then begun to fall, and that, when anchors under 20 cwt. were being reduced from the excessive price of twenty-four shillings to twenty-one shillings and sixpence, the Admiralty were paying the exorbitant rate of forty shillings for them. This seems extraordinary, if not incredible. Therefore, says Mr. Seely, at question 635, "How did the government

get tenders for anchors?" "I can only say," answers Mr. Trotman, "that the anchor contract has been a mystery to the whole trade." "But," asks Lord Henry Lennox, at question 636, "do you say that the way in which the contracts were made is a mystery?" "Yes," says Mr. Trotman, it is a perfect mystery, in fact, many persons suppose that the Admiralty anchors are all made in the dockyards. Altogether the anchor controversy is a strange one. The Storekeeper-General officially, one would think, responsible for such matters, is impervious to criticism, and blandly refuses to admit the responsibility, or even his knowledge of anything beyond the immediate precincts of his official room. He maintains that the Board is responsible. The Board, however, represented in the House of Commons, does not seem more sensible of its power or obligation than the Storekeeper-General. In 1858 Mr. Bentinck asked the First Lord why Mr. Trotman's anchor, which was acknowledged by an official committee to be 28 per cent. better than the Admiralty anchor, according to certain tests, was not in use in the navy? Sir John Pakington informed him then that "he believed the simple reason was that a great number of anchors of the old construction remained in the dockyards, and were being used for the sake of economy." Yet the condemned navy anchor was delivered into store, time after time, since the date of the report of the "Anchor Committee, in 1853, for which the payments up to the present time have exceeded £180,000." Again, Lord Clarence Paget was pressed about the matter in 1860, and said, with characteristic candour and frankness, that "Mr. Trotman's anchor was objected to by the profession." Again, the Duke of Somerset said he believed some ships, "during the Russian war, which used Trotman's anchor, had got adrift from their moorings in the Black Sea." Yet, curious to say, it was used in the royal yacht all this time—how or why, no one seemed to know, except that the then captain, Admiral Denman, reporting on it to the Admiralty, said (see question 658) that "it is vastly superior to the Admiralty anchor in every respect!" So much for the anchor controversy. Upon this question, at any rate, the evidence is very instructive as to Admiralty management and dockyard economy."—*Daily News.*

There is no doubt that figures are figures, and on the shewing of these unerring witnesses, the Admiralty proceedings have been condemned. But what do these figures shew—first, that a superabundance of *anchors* were already in store, and even ready for use in our dockyards, and thence the question very naturally arises, "why get more." Let us see if we can see the reason why?

Fashion may be fashion, and it holds yet its ground just as well as anchors do. Many of our readers remember the old long anchor row of Portsmouth dockyard, where were stored up old anchors of the war, but of date "out of mind." But if fashion holds its sway in every-day matters, and certainly any one in these days would not be seen in a coat of the fashion of last century, how much less would a ship, if it be left to her own decision as a thinking animal, would use an anchor of last century, when it is considered that although improvements in

the cut of the coat might not involve danger of life to the wearer, yet improvements in the form of the anchor would assuredly involve danger to the safety of the ship and the lives of all on board. Now, we know nothing of the firms alluded to above, and can speak just as independently of a pet anchor as we can of a prize anchor even of world-wide celebrity. The Russian war might also have caused a rise in the price of labour, and therefore of anchors, and if there has been *mystery* in the subject of the expense of anchors, there has no doubt been good reason for it, although that reason has not been apparent to some persons. Suppose that it be complained that, "the anchor contract is a mystery to the whole trade." The real mystery appears to be how a prize anchor finds its way into ships of the navy where it is most unwelcome. It may be endowed with abundance of fame, but that fame has done little towards its progress in the navy. As to the Storekeeper, what can he be expected to know about anchors, except that there are a certain number on his list of all kinds, that may be in store, and all kinds mean old and new of different qualities, for setting aside material, there is just as much difference in the quality of an anchor for holding a ship as there is in the cut of a coat to answer the fashion.

Now, whatever might have originated the course pursued by the Admiralty, it was common at one time to allow naval officers, appointed to the command of a ship, to choose the anchors which they were to use while she was under their command. The Admiralty anchor, let us call it an old fashioned affair (with no derogatory meaning to the Lords), was once in no favour in the navy. It was as near an approach to that of Rodgers's, without infringing a patent, as could be. Even a prize anchor might be acknowledged to be better in holding qualities than the old one of the Admiralty, a reason perhaps which guided the Admiralty in allowing officers to choose their own anchors, and yet we do not remember ever hearing of an officer choosing to risk his ship with a prize anchor, although we have heard of it being supplied to a ship unasked for, and much to the disgust of her commander. But the anchor of the late Captain Rodgers was, and is the favourite anchor of the navy as well as the packet service, about which much has been deservedly said in the *Nautical Magazine*. Mr. Bentinck might ask the First Lord of the Admiralty, Sir John Pakington, why a prize anchor was not in use in the navy, and Sir John Pakington may give as a reason the number of old anchors lying in the dockyards "being used for the sake of economy," but what was stated in Lord Clarence Paget's answer? that some one's anchor "was objected to by the profession." No doubt it was, and here is the mystery above alluded to—navy officers did not like it—besides being the heavy, cumbersome machine that it was. It might be respected by the commanders of some kind of craft, who care little about fouling their anchors or sitting down on them in a roadstead, and Admiral Denman might say in former days, that it was superior in every respect to the old Admiralty anchor—but we have good reason for believing that the Admiralty anchor of his yachting days was not the

Admiralty anchor of these, which we believe inherits the principle of that of Captain Rodgers.

So much for the difference of views between a civilian First Lord of the Admiralty, and a secretary who is at present an Admiral with his flag flying. The Duke of Somerset, even as a civilian, could say nothing for a prize anchor, but that he believed some ships during the Russian war, which used it "had got adrift from their moorings in the Black Sea." But Her Majesty's yacht using it all the time is so good, that really it has done more harm in the quotation than if it had been altogether omitted. A yacht, a fine weather pleasure boat, comparing the working of an anchor to those trials which it would undergo in the rough duties throughout the world of a ship of war. Certainly a prize anchor may be better than the old one, yes, the old Admiralty anchor, but it is yet to be proved for the uninitiated landsman, whether it is better than the new one. And this we suppose, if it has not done so already among other things, time will show. Therefore, Mr. Seely can take little by his doctrine, that there is abundance of old Admiralty anchors in store, when he learns that the best thing to be done with them is not to expose H.M. ships to being cast ashore by using them, but to break them up as soon as possible, melt them down and make new ones of them of a more modern fashion. For new anchors on good principles are safer than old ones on bad, and should a ship be caught at anchor on a lee shore, where would be the economy in using the last.

There seems to be a difference of views between some officials and Mr. Seely's committee as to the resources of dockyards and their labour being applied to different ships. It is, no doubt, a desirable matter for the sake of perspicuity and even comparison to get at the real cost of a ship, and, at all events, will afford a guide as to the proceedings of contracts, whether, in fact, a ship can be built in a government yard (supposing that the government were prepared in that respect) cheaper than she could be by the contractor. One thing would be gained, and that a most important one, and that is we should not hear of any short copper bolts, such as was reported from Devonport in the breaking up of H.M.S. *Sepoy*, a statement of which appeared in the last number of the *Nautical Magazine*. But in respect of the division of labour and setting down its expense to the quarter for which it was incurred, the difficulty of distributing the labour of workmen, and thence knowing the quarter on which it has been expended must at all times be considerable. The government yards leave the employment of their force to be distributed according to the wants of the day, and these wants are varied continually by not only the arrivals home from abroad, but by the orders to set hands to work on different ships as urgency may require. How different is this from the proceedings of private yards where two or three ships may be building according to the calibre of the yard. Here, the owner of the establishment has only to complete the work he commences, and turn out of hand as soon as he can each piece of work he has commenced without interference: whereas, in the government yards such a variety

of work is in hand, and some that will not keep, as the saying is, that a man may begin the day on one ship and end it on another. If this is to be looked on as a departure from a rigid system of economy, we cannot see the inapplication of the labour. That labour is bestowed, and, whether in one way or in another, it is still bestowed, and admitting the inconvenience of it to economists it seems to result from the exigency of the service in ministering to one of the most necessary as well as the most powerful arms of the State.

ANCIENT ROUTES,

Adopted by the Spanish Galeons and Fleets.

IT was the early custom followed by the Spanish galeons, as well as their fleets (the tracks of the former being primarily established) to make their voyages to America from San Lucar de Barrameda. When bound to Vera Cruz (West Indies) they regularly sailed in April and May, so that they might arrive there before the season of the hurricanes of August and all September* that infest those windward islands; and also with the view of escaping the Northers of the Gulf of Mexico, that were formidable on account of the small size of vessels then in fashion. When bound to the Spanish main as we (English) call their *Tierra firme*, they sailed in August to avoid running to the Canaries, so trying in winter, as well as to facilitate their making Nombre de Dios (the furthest port of the galeons at that time) at a temperate season of that climate.

If they departed from San Lucar in the summer, they stood to the S.W. to make point Naga of Tenerife; and if they left in winter they ran a point more southerly for Cape Cantin, so as to get the Trades earlier, and also into warmer and less tempestuous seas; and from this parallel they ran S.W.b.W. also for point Naga, where they generally found fresh breezes from E.N.E.

Having made the islands, the ships came to an anchor in the port of Gomera,† as in earlier years they would anchor off the Grand Canary for supplies of provisions. Coming from San Lucar they had

* By that curious uncertainty of seasons, especially of late years, as may be instanced of 1867, the hurricane that did so much mischief at St. Thomas occurred near the end of October.

† Gomera it will be remembered was the port in the Canary islands from which Columbus finally sailed in 1492, when he discovered America. It seems to have been the great port of those islands from which mules were embarked for Spain, and which islands were the principal trading places for those animals. The number of them that died on their voyage to Spain was the occasion of the intervening sea being named *El golfo de mulas* or the sea of mules. In a volume entitled "The Landfall of Columbus," by the Editor of this journal, a neat drawing will be found of the port of Gomera, and a representation of the vessels of Columbus, from his own description. It is published by Potter, 31, Poultry.

generally provisions for not more than fifteen days, and allowed eight days for their passage to the islands.

From the Canaries they stood to the southward about thirty leagues, to avoid the calms which are found as far as fifteen leagues to the West of Fierro, and from thence they steered their course for I. Deseada.

There were two courses followed by them for this island: the oldest was to steer W.b.S. until the latitude of 15½° was attained, and this being the latitude of Deseada, they then ran West. The more modern route was when finding themselves clear of the calms of Fierro, to run W.S.W. to latitude 20°, then to steer W.b.S. to attain the latitude of Deseada, with the view of making sure of seeing it from one day to another.

The length of this voyage, favoured as it was by the Trades, was twenty-eight or thirty days; for the days' runs never exceeded thirty leagues at most, as the vessels shortened sail every night.*

At this island or those of Martinique or Dominica, the Spanish ships separated for New Spain; and the galeons for the Spanish main, when they had sailed under convoy.

The fleets then followed to their several destinations, steering from these islands to the N.W. eighty or ninety leagues, until sighting Santa Cruz, and making it at a distance of two leagues, they ran W.N.W. about thirty leagues for Cape Roco, then West of Porto Rico. They passed this cape by the shoal four leagues from it, and sighting Mona island (which in case of necessity affords good anchorage), they ran ten or twelve leagues for Isle Saona in the same latitude. Leaving this island and not nearing it within two leagues on account of its rocky approaches, and coasting San Domingo they would anchor off point Nisao ten leagues to the West of the city. If the fleet arrived here after nightfall, they remained under sail until morning; and knowing that Ocoa was nine leagues to the West of the city of San Domingo, they anchored in the bay of Zepesepin about a gun shot from it.

Having replenished water and provisions they sailed for Port Bahia, standing out to sea five or six leagues to keep clear of calms: and from thence they ran thirty leagues West for Isle Beata or Atovelo (Alta Vela) passing them about a league off without risk, as there is none in the channel between them and the coast of San Domingo.

From this position they shaped a W.N.W. course, borrowing by night more to the westward so as to keep off the coast, and with this course they made Cape Tiburon, the westernmost part of the island, affording water if required, and sixty leagues from Beata.

Running then to the N.W. to pass north of Navasa or by el Gilovento, which is twenty leagues to the southward, for the land of Santiago de Cuba, coasting as far as Cape Cruz in latitude 19½°. From here they turned W.N.W., running forty or forty-five leagues for the meridian of the bay of Sagua; from whence (by day), standing N.W.

* A time-honoured custom, adopted up to a late period in H. M. ships.—ED.

ninety leagues, they discovered the Isle of Pines in 20° latitude, ten leagues to the South of the Jardines rocks.

If by night, leaving Cape Cruz standing forty leagues on the above course, they steered for a day West twenty-five leagues, and then returned and stood in for the Isle of Pines. Also to avoid the Jardines from Cape Cruz they made the Caymanes to the westward, one of which is distant from this Cape about thirty and the other forty leagues, and both in 18° 30′ latitude. On the north side of the Great Cayman there is convenient anchorage in fourteen fathoms water.

Having reached these islands they then stood to the N.W. to make the Isle of Pines; but at the distance of three leagues, on account of its reefs. From thence they stood on to make the Sierras de——, and afterwards Cape Corrientes, which is thirty leagues from the Isle of Pines, and in 21° 30′ on the West; off which cape they might anchor in twenty fathoms of water.

From Cape Corrientes, standing along shore for twelve leagues, they would arrive off Cape Antonio, the westernmost point of Cuba, in latitude 22°.

From this cape for Vera Cruz there are two routes; one for winter, the other for summer. The winter route is outside the Campeche bank, and the summer route inside of it; and the distance is two hundred and eighty leagues, occupying from ten to twelve days.

To follow the route from Cape S. Antonio outside the bank, they steered W.N.W. for fifty leagues to give the Alacranes a good berth, something over 22° latitude, East and West of Cape S. Antonio, not approaching them nearer than thirty fathoms. From this depth they sailed N.W. fifty leagues until they reached the latitude of 24°, so as to pass the Negrillos in latitude 23½°. From thence they stood West fifty or sixty leagues, and then S.W. for the Sierras of Villarica on the coast of New Spain, which are in 20¾° to windward of Vera Cruz, this port being due South of them: and then running down the coast at the distance of three leagues, to avoid its shoals, they entered Vera Cruz by the north channel.

In summer time, that is from May to September, they ran by the lead, steering W.S.W. from Cape S. Antonio about forty leagues until striking soundings in thirty fathoms. From thence they would run to the westward about one hundred leagues in about twenty fathoms to pass through the channel between the Triangles and Isle Arenas, which is in about 22°, although they might pass southward of the Triangles and isle de Sarsa in 20° latitude. These islands being passed they would be off the bank, and steering S.W. for sixty or seventy leagues, until sighting the heights of San Martin in latitude 18°, they would have the islet of Roca Partida in view. From this position they would run along the coast W.N.W. to avoid the Cabezas islet, and enter the port of San Juan de Ulua on the same course, by the S.E. channel called the Brisas, leaving the isle of Sacrificios to the southward.

We have yet to say more of the galeons, and with reference to those bound to Deseada, Martinica, and Dominica. Passing between the

two last these vessels stood W.S.W. for Cape de la Vela about fifty leagues. Then steering W.b.S. they would reach 12° S. to make point Chichibacoa, or Bahya fonda, which is on the coast of Cape de la Vela, twenty-five leagues to the eastward. From thence W.b.S. they steered for Cape de la Abuja, coasting as far as the River Palomino to sight the Sierras Nevadas, finishing with the Ancones and Sierra de Bomba by the port of Santa Martha. Running W.N.W. afterwards for a day till they lost white water; from thence they steered S.E. for Morro hermoso of Bugio del Gato and Point Canoa running along the coast of Cartagena.

They then prosecuted their course for Nombre de Dios. From point Samba they would proceed N.W. eight or nine leagues, fifty leagues West, and about thirty S.W. to sight, on the South coast, Cabeza de Cativa or point San Blas: which in time of the Vendavales may be done from Cartagena, and running along the coast they reach Nombre de Dios, which is ninety leagues from Cartagena and five or six from Portobelo to the westward.

From Nombre de Dios to the Havana.

The galeons usually sailed in the month of February, and steering eastward until they were nearly North and South with the Cabeza de Catiba, they then stood E.S.E. to make the island of San Bernardo: afterwards East for Barú, until in the latitude of Cartaxena where they went to in order to secure making the Isle of Pines, the Trade wind being South-west, and then to run West, with the view of not getting entangled with Camaron, Roncador, Quitasuenos, and Serranilla reefs. Thus from Cartaxena they stood North for Point Canoa, then N.W. to get to 13° N., as the reefs extend as far as 16½° N. The same course took them to the Isle of Pines, the course from which as appears above to Cape San Antonio. From this cape they stood N.W. six or seven leagues to avoid its shoals, and N.N.E. for the Tortugillas; and if the wind prevented this they put their heads to the southward, and entered the Havana.

From Vera Cruz to the Havana.

The ships sailed in March so as to obtain the Northers from the bay and thus shorten the voyage.

From Vera Cruz they steered N.E. until they reach 25° N., from whence they steered East as far as the Tortugillas, and from thence to the Havana. They took care not to get to the northward of 26° N. for when they got into the Bay of Carlos or Florida, it was difficult to get out with S.W. winds.

From Havana to the Azores.

From three or four leagues at sea, they worked against the trade for the entrance of the Channel: or if the wind was fair from the port they steered N.E. for the Martires, and giving them a berth of a league, they entered the Florida Channel and coasted it up to 28° N.; the shore being bold, although it is said to have some rocks off it.

Leaving the Florida Channel they continued their course for the Azores by the northern and Sargasso Gulf, with the intention of passing to the northward of the said islands, if their passage was to be made in summer time: in fact, considering themselves clear of the Channel they steered to the N.E., until they reached lat. 32° N., from which they then stood E. by N. as far as 39° to make the islands.

In winter on leaving the Florida Channel, they steered east rather northerly for Bermuda; which is in 33°; leaving it to the northward whether they made it or not, but considering it as passed they continued as far as 37° north to make Isle St. Mary. They considered this route shorter, in the course of which, they were delayed more than the summer route, a proof that the current set to the N.E.

They knew also when they were nearing the islands, by the variation of the compass decreasing to nothing, as they had found it to be so there from experience.

In summer time the galeons usually touched at the Azores, and ordinarily at Tercera; but at St. Michael instead when the southerly and S.E. winds did not allow of their touching at the former.

It was ordered that from September to April no vessel should anchor at the islands, on account of their bad harbours, and at no time in fact were they allowed to do so if it could be avoided, so as not to lose their anchors, it being provided that vessels should go off to them with refreshments to replace their sea allowance, by the *Casa de Contratacion*,* to assist them on their passage to Spain.

From the Azores to Seville.

Leaving these islands they stood to the eastward for forty or fifty leagues to be sure of making the coast of Spain with N.E. winds. From thence they made for Cape St. Vincent on an E. by S. course, lying east and west with Sal Medina. Having made the Cape they ran along the coast as far as San Lucar, borrowing to the N.E., so as not to leave the coast until they had made the Arenas Gordas, which are five leagues to the west of San Lucar. And crossing its bar with the tide they anchored in the port of Muelas which is that of Seville.

It may not be departing from our object now to say something here of the principles on which these galeons and Spanish ships sailed with reference to the government ships of war; the manner in which they were improved and the mode of sailing them according to accounts obtained from the *Casa sa Contratacion*, as well as from books and some ancient documents.

* It appears that the proceedings of these Indian fleets (*i.e.* West India) were regulated by an office something similar to our India House of former days. The meaning of the term is thus rendered literally "a tribunal," the object of which is to take cognizance of and decide on the business concerning the commercial transactions of the Indies. It was composed of a council consisting of a president and several members, some of which wore the Roman toga, and other gentlemen of no profession, besides a fiscal officer. In the earlier days of its existence it was established at Seville, until it was removed to Cadiz, where it remained until 1791, since which time it has no doubt disappeared with the wreck of time.

It may be first observed that in those early days, when the ships that sailed for the Indies amounted to six, they assumed the name of a fleet: from such small beginnings things went on increasing in the manner to which we shall here allude, and by those arrangements, of which we shall give a brief account.

In the year 1501 the first fleet was prepared at San Lucar for San Domingo composed of thirty-one vessels under the command of General Antonio de Forres. In the following year 1502, they sailed, but had scarcely done so when they encountered stormy weather, from which they escaped after considerable injury; but another fleet prepared by Christopher Columbus, sailing in the month of July of the same year from San Domingo lost twenty-three ships.*

In the year 1521, four or five ships were ordered to be fitted out against the corsairs, which infested the coast of Andalusia and Algarve, the cost of which was defrayed from a tax levied on the silver, gold, and merchandise, that arrived at the ports of those provinces in ships from the Indies, as well as the Canary Islands; all that entered them having to contribute, no less those in the interests of the king than those who owned the goods at a certain rate per pound.

In the year 1522, another fleet was projected which should be continually employed in cruizing on the coasts, as well as to the Azores, and which should be maintained from all kinds of goods which arrived from the Indies, the Canaries, and even from Madeira, and the coast of Barbary, without reserve of government or any privileged persons' interest, adding thereto the prizes which might be made and the fifths of His Majesty. This was the origin of the Royal Navy of the Indies, the administration of which was for many years under the consulado.† From which also it is stated that previous to the year 1526, the Navy or ships of war originated.

It was in the year 1554 that it was ordered that whenever eight or ten ships were freighted and armed they should have permission to sail for the Indies; and another order of the 11th August of the same year, stated that when such ships amounted to six they might sail for America.

In the year 1561, it was ordered that two fleets should sail every year for Tierra Firme ‡ and New Spain, the first in January, the other in August, with a *Capitana y Almiranta*.§ Those bound to Dominica from whence the *Capitana* with the ships for Tierra Firme would depart, and the *Almiranta* with those for Vera Cruz. That the

* It will be remembered that Columbus's first voyage of discovery took place in 1492. See "Landfall."—ED.

† This Consulado is most probably another term for Casa de Contratacion.

‡ The former of these terms no doubt alluded to the main land of South America, or the part known in recently past times as the "Spanish main," the latter, New Spain, possibly meant Mexico with Vera Cruz.

§ This term "Capitana y Almiranta," signifies two distinct ships accompanying the fleet, most probably for their protection from corsairs, as privateers were then styled. Whether they were to trade or not appears in the sequel but their principal objects were protection, and in the event of accident happening to any vessel of the convoy they were to save her cargo of goods as well as they could.

Capitana and the *Almiranta* should be less loaded, that they might receive on board the cargo of any ship that should be lost, as well as for resenting any injury, and they should demand payment for it. That all the ships of the fleet, and those which sailed from the Canaries, should return to San Lucar or forfeit a thousand ducats. That the ships from Cadiz should sail at the same time as those from San Lucar; but that unless they were registered they should wait for the next fleet.

By the year 1565, the galeons or ships of war did not sail as convoy with the fleets, but it was ordered that a ship of war of three hundred tons, should convoy them, the ship carrying eight guns of bronze and four of iron, since the merchants' ships then carried one hundred tons less of cargo, and each had thirty soldiers, an order which did not last long, for in the year 1567 there was a Capitana and Almiranta in the fleet of General Diego Flores de Vadez.

Among the vessels called galeons and forming the vessels of war for the Indies, there was a great variety, and in the year 1568 they amounted to twenty. They took the name of galeons from their construction, for they had galleries and oars, although of about two hundred tons more or less. But afterwards as their size kept on increasing so they diminished in number. It was stipulated that the consulado which received the duty of twelve per cent., should undertake to prepare twelve ships of war every year, and five pataches or smaller vessels.* For the Navy eight galeons, ships of six hundred tons, and three pataches of one hundred tons for the *Margarita*,† and two of eighty to follow the Navy. For every fleet to New Spain two ships of at least six hundred tons, and two pataches of eighty or upwards. For the *Capitana* and *Almiranta* of Honduras two ships of five hundred tons; and if in any year, there was no fleet, three galeons and a patache should be dispatched to New Spain by the treasury of the king. The provision made by laws and ordinances in 1574, no order being to the contrary, was that in every year when two fleets should sail one for *Tierra Firme* and the other for New Spain, protected by ships of the Navy, which should include Capitana and Almiranta. This order was confirmed in 1578, it being added that the fleet for New Spain should sail precisely at the end of March, and that for Tierra Firme in August or September. This same year was the first in which galleys were despatched to the Indies against corsairs, two went to Cartagena, with a Saetia.‡

In the year 1580, two other galleys and two brigantines were ordered for the South Sea for the same purpose: and it was ordered that the fleets for New Spain should sail in May, and those for Tierra Firme in

* Patache. A small vessel of war generally attending on a larger. The term is best expressed by our word *tender:* a small vessel of war that attends on the larger or the fleet if there be one applied to all the purposes of heralding and looking out.

† La Margarita: this term seems to signify the pearls or the most valuable articles of the fleet.

‡ A lateen rigged vessel of one deck adapted only for trading purposes.

August, and the galeons in January: so that by running down the coast of Tierra Firme they might arrive at Porto Bello in the middle of April, where they would find the market, and with the results of their sales would reach Havana in the middle of June, to join the fleet of New Spain that would then be arriving there, and that for mutual safety all the vessels might sail in company for the kingdoms of Castile.

In 1583, two other galleys were despatched to Carthagena, and in 1587 others were despatched to Havana to guard the coast (as Guarda costas). In 1590, four more were sent for the protection of the windward islands.

In the year 1610, the order was renewed for the fleet to sail for New Spain at the end of March, and for Tierra Firme by August and September. From this it appears that the experience gained since 1578 shewed that this was the most proper time.

In 1620, it was ordered that ships for the Tierra Firme fleet that sailed this year, should not be over four hundred tons, and that the tonnage of all together should not exceed one thousand six hundred tons.

In 1625, two galleys were despatched to Cartagena from San Lucar.

In 1628, large ships of five hundred and fifty tons were excluded from the Indian route, not only mercantile but also ships of war were included in this order.

In the year 1634, a new rate of insurance was made with the consulado; it appearing that a larger number of vessels should be despatched than those which had gone from 1613, when the galeons de la guarda of the fleets for Tierra Firme went in ballast. It was proposed that these also should carry some cargo according to their size, as was done by the Capitana and Almiranta, since they went loaded although fraudulently, their register not permitting it. And considering the oars of the numerous merchant vessels which accompanied it, those which accompanied the fleet to Tierra Firme and New Spain, in future were each to be allowed to carry two hundred tons of cargo. This being about to be repeated the following year, the necessity of reforming it was shewn by the ministers, and what they were to command the captains of the galeons were not permitted to know before they sailed. This order was then carried into effect, but it was transgressed very soon afterwards. From the year 1717, until the present time, the representation of 1619 has been observed, which is, that the galeons were not allowed a register for cargo, because being free and unembarrassed with goods, they might be ready to receive the cargo of any vessel which might be injured on the voyage or even wrecked. It is a consideration however, which has not always been valid, for in the years 1632 and 1636 the galeons were again allowed to carry cargo.

Another Glance in a Mirror at Ourselves and our Nautical Institutions.

(Continued from page 529.)

Lloyd's is maintained essentially by subscription, and each member in compliance with certain laws contributes to its maintenance. These members consist of three classes, 1, the underwriters themselves, 2, members who are not underwriters, 3, the annual subscribers. The underwriter pays the sum of fifty pounds on entrance, besides an annual subscription of twelve guineas, and five guineas for every assistant or substitute who takes the place in the establishment. Non-underwriting members, that is to say, brokers, pay at their entrance the sum of twenty pounds and a subscription of four guineas for themselves, and as much for every clerk they employ. Annual subscribers always pay five guineas each. The underwriters who pay the largest are also those on whom the responsibility of the business depends and from whom guarantee is looked for. Then to become an established underwriter requires a recommendation signed by six members of the corporation. The great importance of such control will be readily seen when it is considered that this reasonable body, this apparently commercial nobody, or this mere myth of persons, above all owes its success and reputation to the integrity of the whole of the persons who form it. It is the ruling care in the choice of its members that secures the stability of the establishment along with the confidence of the public.

It should not be forgotten that there is no material responsibility existing between underwriters,—that each party takes his own risks, and responsibilities to be met by his own resources or those of the maritime assurance company to which he may belong, and that the different members of the corporation are quite independent of each other, and only connected in a moral point of view. The affairs of the Society are managed by a committee of twelve members, one of whom performs the duty of chairman. For this office the committee generally selects a wealthy London merchant who fills an eminent position in the world, and has a seat in parliament. The rest of the staff consists of clerks, messengers, and a certain class of persons designated by the curious name of waiters, so that altogether there would seem to be every reason to suppose that the establishment was really a coffee house.

There is no doubt that with the subscriptions, and perhaps some other sources of revenue, this establishment of insurance is very rich. One portion of its funds is devoted to alleviate certain cases where the persons have suffered from losses by sea; another to protecting seamen from ill-treatment by barbarous nations, and especially in rewarding those who have saved lives from shipwreck. As the only establishment of its kind Lloyd's is a good specimen of what a great commercial nation can do to encourage the seaman and contribute to

the safety of navigation. And yet this influence of capitalists would avail little without brave and daring men for sailors. Should they not also claim our attention. We will first have a look at the sailor on shore and see what kind of a life he passes in a large city when away from his own element, he has left his ship, returned from sea, and is waiting to join her or another, and he again takes to his real home—the ever changing ocean.

Scarcely does a vessel arrive in the Thames from a long voyage at Gravesend than she is assailed by all kinds of people with offers of service. These persons (called crimps) with the most careless and easy manner, and with the veil of joviality and cordial generosity over their real designs, once on board tempt the seamen with every kind of offer to go on shore with them to their houses. This motley group is composed even of lodgers themselves as well as their landlords with their emissaries called *touters*, and which latter receive so much per head for every seaman they take to their houses, which are furnished but are of the very lowest description, called *lodging houses*. The allowance paid by these crimps to their touters varies according to circumstances, generally speaking the lowest and worst houses pay their agents much better than the more respectable. The sailor on his arrival from abroad is thus bought and sold by virtue of a contract of which he knows nothing. As for poor Jack as he is called, he scarcely knows what to make of all the tumult, and his well known openness of character renders him an easy prey to these sharks. Many of his shipmates have thus entered the port of London for the first time and find no one they can consider a friend, nor anyone to guide them in their ignorance. No doubt they find false friends and are among men of whose intentions they are entirely ignorant. And it must not be forgotten they have been long away from society, separated in fact from all the world. A sailor on shore naturally feels himself strange: he who can protect others from the perils of the storm knows not how to shield himself from the perfidy of his fellow-men or from his flattering language;—simple and without guile, how he would be astonished did he know that he was but the victim of artifice, and that these seeming friends are but wolves in sheep's clothing. Some no doubt have been in London before, and know from experience the dangers to which they are exposed there, and their anger finds vent in a storm of ugly words against these requins de terre, these land sharks —the title by which these persons are known in their language. But in spite of himself Jack who is always too credulous is deceived. Already taken in he considers himself a match for any one. And what after all has he to fear. Were it necessary, would not they lay down their lives for him? He knows very well that he will be devoured by these sharks, but how often has he pledged himself to them, and with the utmost coolness he takes the same road which he has done and which places him within their fangs.

In London this haunt of sailors is not extensive. It is at Wapping, in the vicinity of the docks especially where the dens are prepared for their reception. Their owners know very well the character of the

English sailor and of course take him on his weak side. What Jack likes to see on shore are the emblems of his profession. A public house with a ship for instance as its sign with all sail set is sure to please him. She will have for her crew every sailor who comes near her, and the owner who knows very well how sensitive Jack is to every thing concerning the sea takes care to embellish it to his interests. The house will perhaps be surmounted by a mast with rigging; he may add a great gun, if so all the better: but the great point is to paint flags on the walls of different countries, for Jack is quite anxious to do justice to all the world. Certainly in spite of such emblems which flatter the feelings of the sailor, many of these houses situated in dark lanes or alleys, and ornamented with obscure windows resemble more dark alleys than places of pleasure. Such however are the dens of the English sailor. Looking closer into them, those kinds of allurements are seen which are aimed at his purse, his health, and sometimes even of his honour. Frequently he is exorcised by the sounds of a violin or the voice of a winning songstress. What will you have he is asked? Now somehow Jack has always a taste more or less for music. Sometimes a syren will be seen at the door verifying the proverb, "Salt water ne lave point does not wash," and loosely dressed for the sake of attraction. The dance, the drink, and tobacco, such are the charms for Jack of the nymph with whom he will lose in a week the gatherings of a year. Generous to a fault, he becomes still more so in excessive liberality, and if he does throw his money to the winds it is to shew that he is rich and that the sea pays well. The English sailor is respected by honest men for his virtues, but in that world which he frequents he is loved above all things for his reckless prodigality. Alas, it is not long ere he pays dear enough for the innocent satisfaction of treating the land lubber, and proving that it was on the ocean that the golden fleece was to be found. In a few days the purse of this sea-rover is empty, the season had arrived for the land-lubber to make him his prize.

The sailor who has money is considered a good capture: but he who has none is one of quite another kind. He is the man whom the crimp rigs out to serve him. He first advances him small sums and exacts from him the interest of eighteen-pence per pound sterling. After a long voyage Jack naturally wishes to renew his old habits of sea-life and the tar bucket. His friend the crimp undertakes to fit him out and goes with him to a *slop dealer*. Of course he furnishes him with what he wants charging him fifty per cent more than the proper price. But what is worse in such ruinous proceedings is, that the sailor compromises his liberty. In exchange for these make-believe services the crimp makes a contract for his future earnings. The poor mortal eats and drinks at the table of his real master. After a short interval of revel he finds out that he has been literally sold body and soul. In some cases the crimp comes to an understanding with some captain as unscrupulous as himself, and engages his victim at some low price for a long voyage. He then profits with both hands. With one he takes the price of his protegé from the captain

on the part of the merchant, and with the other the money which his victim has possessed. Many a story of this nature is current of former times certainly, where sailors have been handed over in a state of drunken unconsciousness to a ship at night that is to sail at daylight. The fact is that once having fallen within the clutches of the crimp the sailor is no longer his own master. In one way or another he loses his dignity of manhood in the snares which have been laid for him, fortunate still if he does not suffer in his innocence to expose him to all the rigour of the law.

No doubt Jack has high sentiments of honour. It is related that some years ago a gallant young sailor went into a grog shop at Glasgow, and addressing a man behind the counter, said to him, looking him straight in the face, "Do you know me?" No, replied he, after scrutinising him. "Well," returned the sailor, "I am the fellow who three years ago happened to be in your room here when I accidentally broke one of the squares of your window with my elbow, and there it is with a new one," he added, pointing it out. "I had not then a penny in my pocket, having spent my last on a letter to my mother. But I promised you then I would pay for it when I came home from sea. Since then I have been to India and China, but I have not forgotten my debt." On saying which he threw a sovereign on the counter, received the change from the man and sallied forth with a light heart. Such traits are by no means rare on the part of the English sailor, and although the same man does not sleep sound if his conscience tells him he has a shilling belonging to anyone he may nevertheless enjoy taking advantage of a mercantile commander against whom he is naturally prejudiced. He knows well enough the laws of general good conduct, but as to those of commercial obligation and private contracts he knows nothing. Nothing is therefore easier than to preserve a proper intercourse on points of general honesty. It often happens that the crimp persuades his victims to break an engagement which has been signed for a vessel of the port, and to enter for another, from whence he of course derives an unlawful advantage. If in such cases the law intervenes Jack is of course the sufferer, and not he who has been giving bad advice.

One may thus perceive the great dangers to which the English sailor is exposed when even other traits of his character are taken advantage of. Those chivalrous sentiments which have been banished from society on shore from the last of the last days of knight errantry, would seem to have taken refuge on the ocean, and found a home in the heart of the sailor. The champion of the fair sex defends her with his arm, if not with a weapon on every occasion where he considers her to be ill-treated. No female in distress ever flew to him in vain for protection. He has been seen to deprive himself of his own clothes in winter to protect a mother with her children in a waggon, and to warm the child's little fingers with his own hands, rough as they might be from handling the ropes. An English woman who was travelling in winter very short of money and a numerous family relates how she was in a manner saved by a sailor who took care of her and

her children, with a disinterestedness worthy of the highest admiration, and when she asked the name of her benefactor—Ah, said he, when you hear the raging wind and see the lightning's gleam you will then think of Jack who is at sea.

Unfortunately this noble feeling of Jack sometimes occasions some curious mistakes of which here is an instance. A sailor who had just received his pay and was anxious to treat his friends, when passing through a street, was robbed by a female of his watch and purse. Catching her in the act he gave her in charge to a policeman, who took her to the station. On the way, however, the cries and wailings of the woman went to Jack's heart, who begged the policeman to let her go. But deaf to such entreaty and even refusing a bribe, the guardian of the public refused to do so, but at the same time moved by the conduct of the sailor he considerately averted her danger for the law on her being placed before the magistrate, who, the next morning, requires the charge to be proved. This at least was a satisfaction to Jack, who never could bear the idea of hurting a woman. He therefore cheerfully resolved on keeping by the police-station, casting his eye occasionally at the iron bars of the window, and hearing with feelings of sad remorse the sobs of an unhappy prisoner confined at the charge of an English sailor! At length daylight came. The magistrate took his seat and the prisoners of the night were one by one placed before him. One woman only remained, and as no one appeared against her she was set at liberty. Nevertheless Jack was at the door with a paper in his hand. This was no less than a marriage licence which he had obtained from Doctor's Commons. They soon found a church where Jack related to the minister the occasion of his odd resolution. "He had a weighty matter," he said, "on his conscience, and he wished to marry the woman," he said, "because he had occasioned her much pain." The minister vainly endeavoured to prevent him from so rash an act, but they were married, and Jack sailed the next morning on another voyage. The end of such a marriage was evident enough. Three years had scarcely elapsed since the event, when one fine morning the clerk who had officiated at the ceremony was accosted by a man with a pallid face and unhappy mien, in whom he recognized the admirer of the fair sex. The sailor had come to give twice the sum which the marriage had cost if he could but dissolve the marriage.

One can well imagine how so much enthusiasm can be turned to account by designing men. The English sailor on shore is surrounded by harpies, in whom he believes that he sees the victims of persecution. Such is the consequence neither of his good sense nor his intelligence, but is the result of his course of life. His sailing chart shews nothing of the rocks and shoals of towns and cities. Great as he may be in contention with the storm he is but a child in the midst of intrigues of society. These dragons of the ocean of life (and one can laugh in the midst of them) seize as voraciously as gudgeons of the stream on the grossest morsels which pass before them. And it is not only the English sailor who is caught in London, those of other countries are

even worse treated than they are. There are sharks of more colours than one at Wapping. One of these is black, and is contented to attract to his fangs the sailors who come from Africa!

These facts were long patent and deplored by all English moralists, when in 1827 three captains of the English navy, Gambier, Elliot, and Justice, resolved to put an end to such odious practices. About that time the Brunswick theatre at Wapping fell to the ground and buried many people in its ruins. Its position in the neighbourhood of the London docks was favourable to the project of reform. With their own resources and what they collected, they bought the ground and the remaining materials, with which they proposed to build a lodging house for seamen during their stay at the port of London. Captain Elliot abandoned all the advantages which he had of birth, education, and position in life to shut himself up in a humble abode in the middle of the most discreditable quarter of London. There he was satisfied to superintend the construction of the building, and in 1835, when the establishment was opened he devoted his time and attention to its progress. The work prospered as it should do, and from 1854 and 1859, the directors were enabled to purchase another piece of ground on which to extend the establishment. A new building annexed to the old one, the first stone of which was laid by Lord Palmerston in 1863, was inaugurated in 1865 by the Prince of Wales. To this new building, the Sailors' Home, I was introduced by Captain Webb, the Secretary of the Society, who, in the most obliging manner informed me of everything concerning it.

The Sailors' Home has two entrances, one in Well Street and the other in Dock Street, which last is no doubt the most imposing, its stone façade neatly sculptured contrasting strongly with the adjacent ill-looking houses. The ground floor is occupied by a hall, where there is a daily list displayed of departing ships, and here also is a corridor with offices. Among these, some, such as that in which seamen are engaged or discharged from different ships, are under the surveillance of the Board of Trade; others again, relate to the Admiralty, for instance the office of the Royal Naval Reserve, where seamen of the merchant shipping are enrolled for the Naval Reserve. The Sailors' Home thus lets a part of itself, and the advantages to the establishment of this mixture of parties is evident. The offices are devoted to its business. For instance, the post office, where letters are received and preserved for a year, addressed to the chiefs of the establishment, perhaps, for persons who may be expected there within a certain time. So that while the crimps are striving to detach the English sailor and estrange him from his family, the directors of the Sailors' Home are on the contrary employing the best means they can devise to renovate and preserve in him the fair exercise of his moral feelings. In 1865 and 1866, fifteen thousand letters passed through the establishment, and many of them, like the sea birds about the coast, echo no doubt the feelings of the sailor's heart under the effects of long absence.

Every sailor no doubt comes on shore with an empty purse. His

account with the captain of the merchant ship with whom he sailed is not settled for some days after his return from the voyage, and it is in this temporary distress of Jack that the land sharks plunder him as they can. The Sailors' Home, without obtaining any advantage from the system, advances a sovereign to every sailor in that condition, and leaves him time to receive his wages, at the same time treating him with a generous hospitality.

Another object of solicitude was to place the sailors' hard earned money beyond the reach of being pilfered, and which was generally so easily dissipated. The institution receives under the name of deposits all sums which the inmates desire to entrust it with, and these deposits, for which the Sailors' Home holds itself responsible, amount to a considerable sum. The whole of these deposits from the original establishment of the institution amount to the sum of £1,358,704. On the 30th of April, 1866, the money received during the year belonging to seamen was £94,811. Of this amount they had sent to their families £36,691; in the savings' banks £3,662 had been placed, and the remainder, that is £54,458, had been used by the depositors. The cashier undertakes besides, however small the sum desired to place it out, to send money to the family of the seaman, and all matters requiring experience. The directors have also already considered the subject of instruction. Attached to the establishment is a navigation school, in which are taught the principles of geometry, numeration, and nautical astronomy. It has also the seamen's church, where the seamen of the Home may go on Sundays without going into the street. But the most complete liberty of conscience is left to them, and the religious services are only attended by free will. Such an institution at once displays its own excellent object, that of caring for the well being and morality of the maritime population.

At one o'clock a bell announces dinner. A stone staircase leads to the first floor, where two tables are provided, each in a room; one for officers and the other for seamen. Let us direct our attention to the latter. Groups of seamen are coming in with happy faces, bronzed by long exposure to the sun and the gale. Some are neatly dressed, especially about the neck, the handkerchief passing through a ring, a favourite piece of nattiness about the seaman: others again wear the blue woollen frock in which they have braved many a gale. Here they are of every nation and every colour, for the Sailors' Home is meant for all the world, and the ebony sons of Africa may be seen side by side with those of Albion. When I visited this fraternal resort of the sailor there were not more than three hundred guests: and the secretary remarked to me, that the time was not favourable, the easterly wind which had been blowing for more than a week had prevented vessels from getting into the Thames. Like everything else which depends on navigation the fortune of the day depends on the caprice of the elements; but still they do not affect the general results of the year. In the year 1865 the establishment had received 11,388 sailors of all countries. The total number which it had received from its origin in 1835 up to the month of April, 1865, was

169,905 of whom 49,286 were those who had returned to it after every voyage.

The dining hall of the seamen is spacious and ornamented with two monuments, one erected to the memory of Captain Elliot the founder, and the other in honour of Captain Pierce, who was for twenty-three years the secretary of the institution. The tables covered with clean neat cloths and abundantly provided may here be seen, and being invited to sit down and judge the quality of the meat I did so. The dinner was excellent and certainly equal to what one would pay five shillings for in some London taverns. To me it was curious to see the quarters of meat roasted, the plates of massive potatoes and pies disappearing in the twinkling of an eye, under the attacks of those whose appetites no doubt were sharpened by a life of labour, and the effects of the sea breeze. A glass or two of good strong ale gave a relish to this repast, and as it was a Friday a dish of fish had been added to satisfy the scruples of the Romanist. The repast was served by persons attached to the establishment, and many of whom were old seamen themselves, in fact their promptness and manner soon discovered who they were. Each sailor who dined there was allowed to bring a friend as his guest for whose dinner he had to pay one shilling.

Not content with giving the sailor four meals a day, breakfast, dinner, tea, and supper, the institution provides him with bed and convenient lodging. The most curious dormitory I have ever seen in my life is that which was opened in 1865, and bears the name of Admiral Sir Henry Hope, for many years president of the Sailors' Home. One might consider it the interior of a ship with four decks. The dormitories are in fact cabins to the number of one hundred and six, which succeed each other from deck to deck, in each of which there is a bed, a chair, and a Bible. Light galleries which are reached by stairs lead to a series of doors, or to use a sailor's expression, to each of the upper batteries, constructed of wood. The sailor who sleeps in one of these cabins may easily imagine that he is still at sea. The directors as may be seen have neglected nothing to make him like his home. Besides certain attractive games, he has the use of a library which is under the charge of the Chaplain, and he has also a daily visit from a doctor. He is left as a matter of course to go in and out of the home at pleasure, but at half-past eleven the door is closed and the sailor who wishes to return at any other time must obtain a pass accordingly. And what is astonishing in the midst of all this liberality is the attention to the cost. The officers of the mercantile marine pay seventeen shillings a week, which includes board, lodging, and washing: men and boys pay fourteen shillings. Truly it is very different from the crimps, this economy of the Sailors' Home, for it has no desire to profit by the sailor; but on the contrary, generous hearted men have founded a home, the advantages of which would form a study for the whole world.

(To be Completed.)

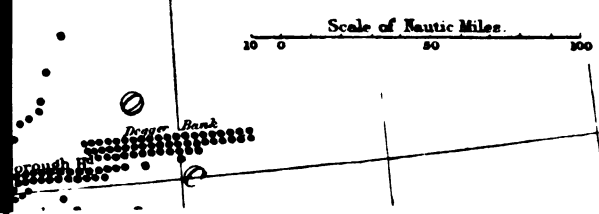
To accompany the Nautical Magazine.

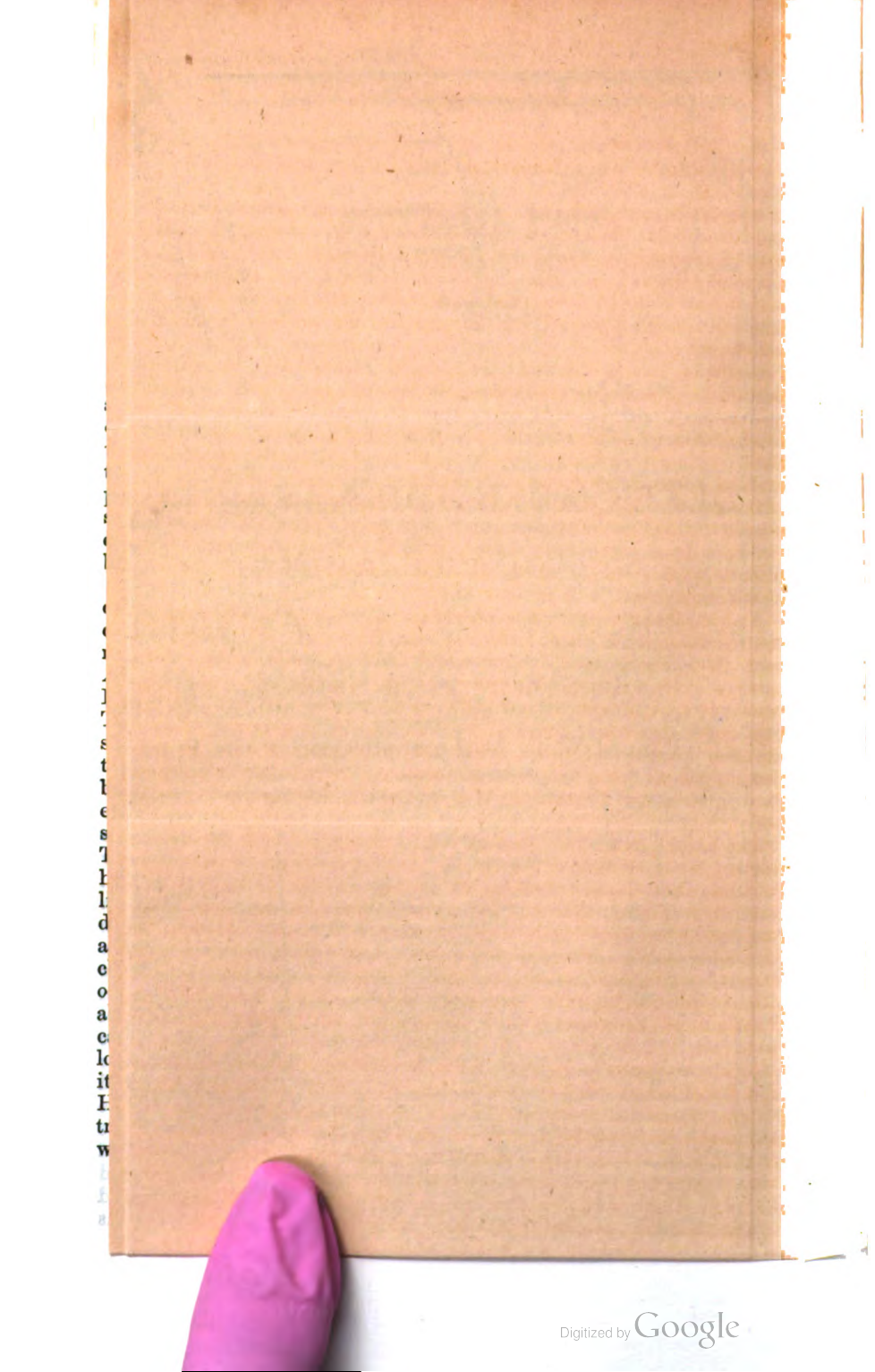
WRECK CHART
OF THE
BRITISH ISLES
FOR
1867.

Compiled from the Board of Trade Register.

SHOWING ALSO THE PRESENT
LIFE BOAT STATIONS

● *Signifies a Casualty.*
Represents a Life Boat.





The Wreck Register and Chart for 1867.

It appears from the *Annual Wreck Register of the British Isles*, just published under the auspices of the Board of Trade, that 2,513 shipwrecks, representing a registered tonnage of 464,000 tons, took place in the seas and on the coasts of Great Britain during the past year, with a loss of 1,333 lives; and that, taking the average of the last nine years, no less than 1,961 shipwrecks have annually occurred on our shores.

Certainly this is a lamentable state of things; yet, as we have previously shown, when it is remembered that nearly 500,000 vessels pass to and from our ports every year, bearing a tonnage probably of 70,000,000, and cargoes to the value of not much short of our National Debt, with crews, including men and boys, of nearly two million souls, the average loss is after all comparatively small indeed.

We do not presume to say that a very large proportion of the shipwrecks and the loss of life that took place on our coast last year might not have been prevented; indeed, that fact is made evident by the *Register*, which clearly shows that 447 vessels were lost entirely by man's carelessness.

As our commerce increases, we must naturally expect a corresponding augmentation of shipwrecks and loss of life; but we contend that both these classes of disasters might be largely diminished if the masters of the vessels only possessed the activity and intelligence which we have a right to demand from all persons who are placed in responsible positions, and under whose charge is confided not only valuable property, but precious lives, and if *shipowners* took the same precautions to insure the seaworthiness and safety of their vessels as they in most cases would do if they had to *risk their own lives* on board them.

The latter part of 1867 was, as will be remembered, unusually productive of shipwrecks on our coasts. During the heavy storms of last November and December alone, the life-boats of the National Life-boat Institution rescued 259 persons from different shipwrecks; and during the fearful gale which continued from the 1st to the 3rd December—and which was the most serious one of the year—326 vessels were lost or damaged, and the lamentable loss of 319 lives took place; thus making this latter storm nearly equal in intensity to the great gale of the *Royal Charter*, in October, 1859, when 343 vessels were lost.

Again, the gales in January, February, March, October, November, and December, in 1866, produced a total number of 793 shipwrecks. Of that number 279 occurred in the month of January of that year, and it will be remembered that on the 11th—the most disastrous gale of that month—Torbay was visited by a hurricane, in which 61 vessels were totally destroyed, or seriously damaged, accompanied by a loss of 35 lives. There were also numerous minor casualties on different parts of the coast on that disastrous day.

Of the 2,513 wrecks which took place during the past year, 2,113 are known to have been those of ships belonging to Great Britain and its Colonies, with British certificates of registry, and 338 are known to have been those of foreign ships. Of the remaining 62 wrecked vessels the country and employment are unknown. Of the British ships, 1,551 were employed in the British coasting-trade, and 562 in the (over sea) foreign and home trade. Of the Foreign ships, 17 were employed in the British coasting trade.

We have already stated that the number of ships lost or damaged on our coasts during the past year amounted to the distressing total of 2,513; and, notwithstanding the attention this great and national subject has received in the last eighteen years, we are grieved to add that this number is 224 in excess of that in 1866; and, indeed, the total number (2,513) is larger than any number of shipwrecks on our coasts in one year hitherto published in this country.

It should here be observed that the number of ships (2,513) is greater than the actual number of disasters (2,090) reported, inasmuch as in cases of collisions, when two or more ships come in contact with one another, such disaster is always reckoned in the *Register* as *one* casualty.

Thus from a table in the *Register* which only speaks of 2,090 wrecks, casualties, and collisions, we observe that 414 collisions took place, and 1,676 wrecks and casualties other than collisions. Of these casualties other than collisions, 656 were wrecks resulting in total loss, and 1,020 were casualties resulting in partial damage more or less serious. The whole number of wrecks and casualties other than collisions reported in 1866 was 1,438, and that was more than the number reported in any year since 1858. But 1,676, the number of wrecks and casualties other than collisions in 1867, is unhappily in excess of the wrecks and casualties of all former years.

The annual average for twelve years, including 1867, is for wrecks resulting in total losses other than collisions 471, and for casualties resulting in partial damage 681. As against this, the numbers for the one year 1867 are for total losses 656, and for partial damage 1,020.

It is a noteworthy and lamentable fact that, according to this register, no less than 411 vessels appear to have foundered, or to have been otherwise totally lost on our coasts from *absolute unseaworthiness*,* unsound gear, etc., during the last nine years; and the number of casualties arising from the same causes during the same period, and resulting in partial damage, is 449. Few vessels are more skilfully and deftly handled than our fishing smacks, and yet 188 of these were lost during the fearful storms of the past year, showing clearly how violent these gales were. But apart from these 188 fishing vessels, it will be seen that the number of vessels employed in the regular carrying trade that have suffered from wreck or casualty during the year is 2,325. Again, it is a distressing reflection that, on subdividing that number, about one half is represented by unseaworthy, overladen, or

* How many ships have gone to sea intended to be lost from this cause alone?

ill-found vessels of the collier class, which are chiefly employed in the coasting trade. For the five years ending 1867 the number is more than half.

This is made apparent by the following table :—

Vessels.	No.
Fishing Smacks	188
Colliers laden	713
Colliers in ballast	242
Vessels with metallic ores	110
Ditto stone ores	150
Ships with other cargoes, and other Ships in ballast	1,110
Total Vessels...	2,513

Thus it is seen that in a large number of cases a shipwreck means not a tempest-torn craft, riven after a noble contention with the elements, but the wretched collapse of a rotten vessel which ought never to have been sent to sea, and the destruction of which hardly causes a pang to its owner!

These are startling facts reflecting no credit on us as a people, and eminently deserving that public attention should prominently and continuously be drawn to them.*

But it is not decayed ships alone that thus come to an untimely end, for we find that during the nine years ending 1867, disasters to comparatively new ships bear a very heavy proportion to the whole number. Thus 209 wrecks and casualties have happened during the past nine years to nearly new ships, and 322 accidents have occurred to ships from three to seven years of age. Then there are wrecks and casualties to 500 ships from seven to fourteen years old, and to 747 from fifteen to thirty years old. Then follow 327 old ships from thirty to fifty years old. Having passed the service of half a century, we come to the very old ships, viz., 60 between fifty and sixty years old: 36 from sixty to seventy; 9 from seventy to eighty; 3 from eighty to ninety; 1 from ninety to one hundred; and 1 upwards of one hundred and one years old. The ages of 298 are unknown. The state of rottenness and of want of repair of some of the ships above twenty years old often calls for remark. Even at the age of twenty-five to thirty it sometimes 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, or to be saved by life-boats or the rocket apparatus.

Of the 2,513 vessels lost or damaged in 1867, 89 were rigged as ships, 141 were steam-ships, 727 schooners, 429 brigs, 277 barques, 287 brigantines, and 241 smacks; the remainder were small vessels, rigged in various ways. Of the 2,513 vessels referred to, 1,147 did not exceed 100 tons burden, 961 were from 100 to 300 tons, 286 were from 300 to 600 tons, and 119 only were above 600 tons burden.

* What other way than this kind of voluntary sacrifice is there of getting rid of sea-unworthy merchant craft? And who suffers by it? No doubt some one prospers.—ED.

The scenes of the distressing disasters are thus given :—East Coast, 1,101 ; South Coast, 259 ; West Coast, 411 ; N.W. Coast of Scotland, 46 ; Irish Coast, 214 ; Isle of Man, 22 ; Lundy Island, 18 ; and Scilly Isles, 19. It will be observed that, as usual, the greatest number of wrecks occurred on the East Coast.

The directions of the gales of 1867 are thus given according to the months :—

January, from south-east, south-west, south-south-east, and north-east ; February, from the west, north-west, south-west, and west ; March, from the east-south-east, south-east, and east ; and April, north-west, west, south-west, and west-south-west. During the months of May, June, July, and August, no serious gales occurred. The September gales were from the south-west and west ; October, from the south-west, west-south-west, west and north-west ; November, from the east-north-east, north-east, south-south-west, and north-west ; and in December, from the north, north-north-east, north-east, north-north-west, and north-west. It will be observed that during December, in which month the most terrific gale of the year occurred, the winds were northerly in their character.

Having thus, as briefly as practicable, recapitulated a few facts contained in this interesting document, we must now draw attention to the loss of life from the 2,513 shipwrecks during the past year.

As we said before, 1,333 lives were lost from these vessels. This is in excess of the number lost in any year except 1859 (the *Royal Charter* year), when the number reached 1,647.

The loss of life thus recorded took place amongst 279 vessels ; of these, 170 were laden ships, 90 were in ballast, and in 19 cases it is not known whether the ships were laden or light. Of these, 217 were entirely lost, and 62 sustained partial damage. Of the 1,333 lives lost, the very great number of 637 were lost in vessels that foundered, 160 on board vessels in collision, and 445 in vessels stranded or cast ashore. Nearly 300 lives were lost in fishing-boats alone.

The work of the NATIONAL LIFE-BOAT INSTITUTION here stands prominently forward, for it can show a glorious roll of 1,086 lives saved mainly through its instrumentality during the past year.

Another incident connected with the *Wreck Register* is the startling fact that, while the largest number of shipwrecks have happened on the east coast of England, the largest loss of life in the past nine years has occurred in the Irish Sea, it actually being last year more than double the number lost on any other part of the coasts. This is accounted for in some measure by the fact that the largest ships from Liverpool and other ports pass down the Irish Channel ; and when an accident happens to any of them, the loss of life is usually large, especially in the case of emigrant ships, as in the wreck of the American barque *Pomona*, some years since, when no less than 385 persons perished, and in other lamentable instances.

It appears that 729 vessels were wrecked when the wind was at force 6 or under—that is to say, when the force of the wind did not exceed a strong breeze, in which the ship could carry single reefs and

Force of Wind.	1859	1860	1861	1862	1863	1864	1865	1866	1867	Total.	Force of Wind.	Per Centages on each force of Wind.
0	21	8	10	23	15	21	20	19	12	149	Calm.	·57
1	42	23	14	28	28	19	22	26	26	228	Light air. Just sufficient to give steerage way.	1·24
2	60	47	51	56	39	97	100	73	63	586	Light breeze (With which a ship with all sail set and clean full, would go in smooth water.) 1 to 2 knots.	3·01
3	33	14	43	43	27	36	24	23	28	271	Gentle breeze (With which a ship with all sail set and clean full, would go in smooth water.) 3 to 4 knots.	1·34
4	93	90	103	110	100	142	146	170	160	1,114	Moderate breeze (With which a ship with all sail set and clean full, would go in smooth water.) 5 to 6 knots.	7·66
5	174	151	171	187	174	220	203	225	223	1,728	Fresh breeze (In which she could just carry in chase full and by) Royals, &c.	10·67
6	180	171	149	195	174	185	163	197	217	1,631	Strong breeze (In which she could just carry in chase full and by) Single reefs & T. G. sails.	10·38
7	71	90	66	75	57	35	47	62	66	569	Moderate gale (In which she could just carry in chase full and by) Double reefs, and jib, &c.	3·16
8	102	137	124	170	195	39	69	60	105	1,001	Fresh gale (In which she could just carry in chase full and by) Triple reefs, &c.	5·02
9	209	193	230	199	269	221	552	683	603	3,159	Strong gale (In which she could just carry in chase full and by) Close reefs and courses.	28·85
10	182	168	311	218	224	221	120	130	364	1,938	Whole gale, in which she could just bear close reefed main-topsail and reefed foresail.	17·42
11	88	101	102	63	82	30	39	21	52	578	Storm. Under storm staysail.	2·49
12	87	139	52	69	205	42	99	120	80	893	Hurricane. Pare poles.	3·83
Variable.	7	5	20	6	1	9	2	1	2	53	Variable.	·10
Unknown.	67	42	48	46	74	73	50	50	89	539	Unknown.	4·26
Totals.	1,416	1,379	1,494	1,488	1,664	1,390	1,656	1,860	2,090	14,437		100·

topgallant sails; that 171 happened with the wind at forces 7 and 8, or a moderate to a fresh gale, when a ship, if properly manned and navigated, can keep the sea with safety; and that 1,099 happened with the wind at force 9 and upwards—that is to say, from a strong gale to a hurricane.

We had hoped this time to omit the foregoing table, but really the facts disclosed in it are so interesting and instructive, that we feel our Paper would be incomplete without it. Accordingly, we find that during the last nine years the number of wrecks at different forces of the wind are thus strikingly given. We have added the last column, in which the per centages of the wrecks in the nine years according to the varying force of the wind are given.

The accompanying tables, which we have prepared on an admirable plan suggested by HENRY JEULA, Esq., the Hon. Secretary of the Statistical Committee of Lloyd's, give the different percentages of wrecks in the same period according to the various directions of the wind, and the parts of the coasts of the United Kingdom where it blew:—

THE PER CENTAGES FOR THE DIFFERENT DIRECTIONS OF THE WIND.

Points of Compass.	Per Centage.	Points of Compass.	Per Centage.	Points of Compass.	Per Centage.
S.W.	8·66	S.S.E.	4·02	S.E. by S. ...	·57
S.E.	7·84	E....	3·97	Calm	·57
N.E.	7·33	N.N.W. ...	3·82	S. by W. ...	·53
N....	6·51	E.N.E.... ...	3·60	N.W. by W....	·53
N.W.	6·03	S.	2·92	Variable ...	·53
N.N.E. ...	5·55	W. by N. ...	1·20	S.W. by S. ...	·43
Unknown ...	5·26	S.W. by W....	1·15	N.E. by N. ...	·38
E.S.E.	5·12	N. by E. ...	·96	S.E. by S. ...	·38
W.	4·92	N.E. by E. ...	·77	S. by E. ...	·34
W.S.W. ...	4·88	W. by S. ...	·62	N. by W. ...	·33
S.S.W.... ...	4·45	E. by N. ...	·57	N.W. by N....	·29
W.N.W. ...	4·40	E. by S. ...	·57		100·

THE PER CENTAGES FOR DIFFERENT PARTS OF THE COASTS OF THE UNITED KINGDOM.

Parts of the Coasts.	Per Centage.
EAST COAST: Dungeness to Duncansby Head (inclusive)	52·68
WEST COAST: Land's End to Mull of Cantyre (inclusive)	19·67
SOUTH COAST: Dungeness to Land's End (exclusive)	12·39
IRISH COAST	10·24
North and West Coasts of Scotland, from the Mull of Cantyre to Duncansby Head; including the Northern Islands, Hebrides, Islay, Orkney, Shetland, etc.	2·20
Isle of Man	1·05
Scilly Islands	·91
Lundy Island	·86
	100·

The accompanying Wreck Chart tells its usually doleful tale, dotted all round, as it is, from the Land's End to the Foreland, and northward by the Farne Islands to Wick and round by the Hebrides to the Irish Channel. It is sad to think that every black dot represents as usual a wreck on our coasts or in our seas, and thus a dark shadow is cast on the commerce of the year. Not a coast that has not its dot; but it is clear these symbolical spots most thickly gather along the highways of our commerce which are whitened with the sails of all nations the whole year round.

We have thus endeavoured, as briefly as we could, to analyse the *Wreck Register*, and to place before the public the means of appreciating succinctly this elaborate satistical record of shipwrecks.

This document, which is of national importance, reveals a most lamentable state of things. Here are the facts minutely detailed of 2,513 shipwrecks, with the appalling loss of 1,333 lives, clearly and incontrovertibly put before us as having taken place on the coasts and in the seas of the British Isles during the short period of twelve months.

The loss of property, including ships and cargoes alone, can hardly be represented at less than three millions sterling!

We, however, are principally concerned, as we before said, in the loss of life, which is far beyond any money value. By the great unceasing and noble efforts to save life that were made not only by the boats of the NATIONAL LIFE-BOAT INSTITUTION, but also by the Rocket Apparatus under the control of the Board of Trade, and by shore-boats, whose crews are stimulated by the liberal rewards of the NATIONAL LIFE-BOAT INSTITUTION to use every exertion to save life, the number of lives saved last year can hardly have been less than 2,000 in all; and in the great majority of these cases the shipwrecked persons must have perished in the absence of the exertions which were thus used, and particularly so in respect to the services of the life-boats. The *Register* states that the total number of lives saved last year by all means was 5,845.

Thus our country is now honourably distinguished above others for its practical and successful appliances in saving life from shipwreck; and it is right it should be so, for the sea has made us what we are, and has borne our countrymen to all parts of the world. It is our naval preponderance, and the enterprise of our merchants, which have raised us to our present high position amongst the nations of the earth. It is upon the prowess, skill, and adventure of our people that the fabric of British power firmly and inconvertibly stands.

The NATIONAL LIFE-BOAT INSTITUTION has hitherto unceasingly and untiringly discharged the duty which the British public has with such confidence and generosity reposed in it. We therefore think it is only legitimate and right that we should again appeal to the country at large to help a Society which has thus charged itself with the great and national work of saving lives from shipwreck by life-boats and other means, in carrying out with renewed vigour its sacred duty.

THE QUEEN ADELAIDE NAVAL FUND, *for the relief of Orphan Daughters of Officers of the Royal Navy and Marines.*

THE friends and supporters of the little unpretending institution named above will be much gratified on learning the invaluable accession by which its exertions have recently been rewarded. It is indeed a cause for congratulation to be enabled to recognize as their leading Patron, H. R. H. the Duke of Edinburgh, not only himself a naval officer, by whom the well founded claims of the orphan daughters of naval officers can be duly appreciated, but a Prince, whose career, in his profession, has gained him the admiration and esteem both of those belonging to it, and of those who do not, wherever he has been present. We need not quote proofs of this, they are common to the memory of us all. The straightened circumstances of many orphan daughters of our less fortunate companions, whose cases the supporters of the Fund have long been trying to alleviate, let us hope will now be more warmly acknowledged than they have hitherto been, and that inability to assist them from want of means will no longer be as it has been, the usual stereotyped reply of its Managing Committee.

We have always been of opinion that the objects of the Queen Adelaide Naval Fund were of a nature that entitle it to the support (in some degree, according to position), of every naval officer; and for one important reason, because it holds out the hand of benevolence to a class of sufferers belonging to them not reached by that of any other friendly society. How true this is, and how gratefully acknowledged it is, those who dispense its assistance too well know. It is therefore gratifying, in addition to recording the above fact, that we are now enabled to add the names of several naval officers, high in command, to the list of its supporters. These include those of Vice-Admiral the Hon. Sir H. Keppel, K.C.B., Commander in Chief on the coast of China, and also Commodore Oliver J. Jones, on the same station; also Rear-Admiral Tarleton, of the Coastguard; Captain J. F. B. Wainwright, commanding H.M.S. *Terror;* also Captain H. F. W. Ingram, of H.M.S. *Egmont*, at Rio Janeiro, and Captain Colin Campbell, R.N.; forming altogether an accession to the resources of the Adelaide Fund that will gladden the heart of many an orphan to whom relief must otherwise have been denied.

Gratifying as such additions are, the difficulty which the Committee of the "Fund" have to meet is not yet achieved. How small a portion of naval officers yet form its list of benefactors, and yet good attempts to reach their sympathies are incessant. For our own part we have always felt bound to assist the Committee in its laudable object, and when these lines meet the eye of any naval officer, to whom the Adelaide Fund is unknown, we say to him, read the appeal in our number for December last, and if not at hand, take it on trust from us that it is worthy of your support, and should not be lightly unheeded or thrown aside neglected, by any naval officer, in the season of his health and prosperity.

Wrecks and Life-boats; and Lives Saved from the Deep.

The boisterous weather about the Equinox seems to have given some trying work to our gallant life-boats, and a corresponding amount of attention to their services in the peaceful Adelphi. The first application we hear of at the late meeting, on the 1st of October, was a reward of nearly £46 to the Cahore and Courtown boats, for saving twenty-seven lives from the ship *R. A. Tucker*, of Winconsin, U.S., stranded on the Blackwater Bank. The Cahore boat had also previously saved five lives from the *Vivid*, schooner, off Wexford coast, near Poulduff Pier. Then, again, the St. Andrew's life-boat earned a reward for her people, who saved eight lives from the *Oscar*, brig, of Tonsberg, which had managed to get on the rocks off their harbour: and the Buckie life-boat actually rescued no less than forty-five men, women, and children from boats in peril, on the 29th and 30th of September. The life-boats also of Redcar, Llanelly, Howth, Newbiggin, Tenby, and Looe, have been as busy, and as liberally rewarded, saving as many as seven boats and vessels, and twenty-two lives, off Redcar, Bridgewater, Swansea, Hayle, and Goole; and the boats of Wexford, Hornsea, Withernsea, Castor, Rye, Winchelsea, Kingstown, and Ilfracombe, as well as some few shore boats, have been also rewarded for good services.

It will be remembered that four coast-guardsmen were unhappily lost, in attempting to reach the *R. A. Tucker*, by their boat capsizing. A fund being raised for the widows of those men, has received the addition of £50 from the Society. Payments were also ordered to be made amounting to £1,200!

It is satisfactory to perceive these services of the Life-boat Institution almost daily acknowledged; and a reference to the notice of the Wreck Register in our present number (page 603) will show how essential are these services! How many lives would perish were they not forthcoming. It is gratifying to find that large but desultory contributions to its support continually occur. The late Mrs. Warner, a lady of Lyncombe, in Somerset, has bequeathed a legacy to the Institution of £300, for the construction of a life-boat to be named the *Anne*, and has, accordingly, been the means of a station being established for her boat at Lynmouth, Devon. So also another lady, residing in Yorkshire, has given to the Institution the cost of a life-boat to be also stationed at Lynmouth, and named the *Henry*, in memory of her late brother. It appears also that the Institution has resolved on forming a life-boat station at Wells, on the Norfolk shore, from the funds so zealously collected by E. B. Adams, Esq., of Bungay, by penny readings and other sources. E. Chambers, Esq., of Reigate, has also, through his assiduous exertions, collected the cost of a life-boat, which the Institution has decided to place at Newcastle, Dundrum Bay, to be named the *Reigate:* and in the way of repairing life-boats, the Institution has granted £50 to the Scratby boatmen, with which to renew the services of their boat.

The Ancient Order of Foresters too (all honour to them), are busy in the cause of collecting further funds for another life-boat, having just presented their annual contribution of £50 to the Institution; so that our seamen will see that their perilous labours, on our stormy shores, are observed, and that there is a source of relief for them kept alive in the Royal National Life-boat Institution. The meeting was presided over by Thomas Chapman, Esq., one of its Vice-Presidents, supported by Sir Edward Perrott, Bart., W. H. Harton, Esq., Rear-Admiral Sir W. Hall, Colonel Palmer, and Captain Ward, R.N., with their vigilant Secretary, Mr. R. Lewis, of the Temple, and paid all due attention to the various reports of the Inspectors of this valuable Institution.

The General Grant and the true position of the Auckland Islands.

In the early part of the present year of grace, a report came from abroad of the loss of a British ship on the Auckland islands, and in the *Daily News*, May 28th last, appeared the following paragraph concerning it:—"The Auckland islands, where the *General Grant* was lost, have been discovered to be twenty-five miles from their position on the chart."

There was no doubt of the loss of the *General Grant*, but the position of the Auckland islands having been carefully determined by Sir James Ross, with the best chronometers at the service of the government, we must own to having entertained very considerable doubt that these islands were twenty-five miles from their correct position on the chart. We considered, in fact, that the means of Sir James Ross in his Antarctic voyage, when he discovered the Southern Continent, were far superior to those of the *General Grant*, by which they were pronounced to be twenty-five miles out of their position on the chart. We shall not stop to consider the *General Grant's* motive in impugning the correctness of the chart, but are satisfied to find by H.M.S. *Falcon's* report, here quoted from the *Illustrated News* of the 2nd of October, that our conclusions were right, and that the *General Grant* was all wrong. What chart the *General Grant* was using is nothing to the point: it might have been any body's. But on *the chart* (that of the government used by H.M.S. *Falcon*) the islands are correctly laid down, and not out of their position. For our part we know nothing of the *General Grant* or her affairs—but here is another case to be added to some already alluded to in this journal, where the chart has been wrongly pronounced to be incorrect on the authority of a ship wrecked in supposed conformity with the error. Why does the Board of Trade permit this to prosper?

There can be no doubt that to cover a misfortune, whether by accident or palpable negligence, nothing is easier than to pick a hole in the character of the chart. Time passes on, the place impugned may be out of the way and all is forgotten. But happily in the present

instance, the seaman is relieved from the state of uncertainty thus introduced. In the case of the *General Grant*, the ship was lost on an island lying in the south route from our Australian colonies, and therefore, the position of which had long been placed, beyond all doubt, on the chart. So her story may be set aside. She was lost no doubt, but there seems to have been nothing but which might have been *timely* avoided to justify her clumsiness in getting wrecked on the Auckland islands.

In another number we propose inserting a little outline chart with what might be termed the danger circle, shewing the limits nearly to which the Antarctic ice extends from the South pole. Meanwhile here is the report of H.M.S. *Falcon*.

The *Falcon* left Sydney for England, and called at Port Ross, Auckland islands, 180 miles south of New Zealand, on June 19th. The principal object of this visit was to ascertain if any ship-wrecked people were there. None were found.

Another object was to verify the position of the islands, for since the wreck of the *General Grant* in November, 1865, some doubts had been expressed as to the correctness of their assigned latitude and longitude. However, that given to the survey by Sir James Ross seems to be correct, for a very good landfall was made, but no astronomical observations were obtained whilst there, the weather being thick and overcast. A cask containing some provisions for the use of cast-aways was left at the depôt.

The *Falcon* sailed from Port Ross on the following day for Cape Horn, and first encountered the icebergs on July 8th, in latitude 59° S., and longitude 112° W. The ship wound her way through a chain of them 480 miles long, trending in a west-by-south and east-by-north direction. They ranged in height from a few feet to 350 feet, the larger ones being from a mile and a half to two miles in circumference. She finally cleared the ice on the evening of July 31st, in latitude 17° S., longitude 97° W. On the 12th, in latitude 57° S. and longitude 99° W., the bergs were so numerous in all directions, and the weather so misty and thick, that steam was got up and easy working sail kept on the ship to ensure her turning easily. As on some occasions a slight rise of the mist disclosed icebergs right ahead, and close to her, nothing but perfect control over the ship could have averted a collision. The winds experienced during the six days amongst the ice were moderate, and varied in direction from N.W. to N., N.E., and S.E. Mean temperature of the atmosphere 37½°, of the sea 30°; mean height of barometer 29·48 in., attached thermometer 44°.

The well known principle of "great circle sailing" is an inducement to navigators to attain a high latitude in making the passage from Australia to Cape Horn. But the opinion may be ventured that the distance saved by adopting even an approximation to that course, will not compensate for the probable delay the ice-barriers may cause. For a ship is not only diverted from her course, but they seem materially to affect the strength and direction of the wind. Under these circumstances a higher latitude than 55° S. *cannot be recommended.*

The *Falcon* when on that parallel experienced north-easterly winds, and was drawn to the southward. Had not the westerly wind failed, probably no ice would have been encountered. [We think our ship-masters would do well to follow this advice.—ED.]

The *Falcon* has just completed a commission of five years, during which period, she has been employed on the Australian station. She took an active part in the New Zealand war, rendering important services, has traversed 84,000 miles, and has now returned to England to be paid off.

ACCOUNT OF THE LATE EARTHQUAKES IN CHILI AND PERU.

THE following report has been received by the Admiralty, and forwarded to us.—*Daily News.*

Topaze, at Callao, Sept. 14th.

Sir,—I have the honour to forward, for the information of the Lords Commissioners of the Admiralty, the following particulars respecting the earthquake and wave which devastated this coast upon the 13th ult.

2. I have described in a former letter (No. 71) the sudden and extreme perturbations of the tide, which commenced at Coquimbo (*a*) at 7.20 p.m. on the 13th of August. At Caldera (*b*), on the same day, at 8.45 p.m., the sea receded, and suddenly came in, rising to a height of almost twelve feet above the ordinary level; the ships in the bay were whirled violently round, and some of them suffered from collision; one vessel, the *Oaklands*, an English barque, was dashed against the mole several times, and at last bilged and became a wreck. The town of Caldera stands on ground some height above the sea, and escaped injury from the waves; no shock of earthquake was felt there; but at Copiapo (*c*), about fifty miles inland, some houses were seriously shaken.

3. Between Caldera and Iquique (*d*) there are no towns of importance except Cobija (*e*), where no damage was sustained; a slight shock of an earthquake was felt at about 5.20 p.m., and the sea rose and fell irregularly about three feet higher than usual.

4. The town of Iquique had of late years very much increased in size and importance, owing principally to the importation of nitrate of soda. Many shops and houses had been built in the old town, which stands on the rising ground to the west; and along the eastern shore of the bay there was a handsome street, mostly of wooden houses, where the merchants lived, and had large warehouses. The absence of fresh water had, as far as possible, been remedied by the use of large stills, and there was an air of opulence and comfort that contrasted strangely with the barren, rugged country round.

5. The people at Iquique do not appear to have observed on the 13th of August any of those signs in the air and water which are said to be often forerunners of a great convulsion. Things were as usual, when, at a few minutes after five o'clock in the afternoon, there was a low, rumbling sound, accompanied by that trembling which gives a

notice, however short, of what may follow. The natives in general need no second warning, and most of them were out in the streets before the houses yielded to the violent shocks which immediately succeeded. Very few lives were lost, and with the exception of the chimneys of the steam boilers, the part of the town that was on the beach escaped almost uninjured.

6. Immediately after the earthquake it was noticed that the sea was unusually high, having risen about four feet above high-water mark, so gently, however, as to do no damage. Suddenly it receded with great rapidity, uncovering the bay at a depth of four fathoms, and leaving the passage between the island and the main almost dry. While the sea was going out there was seen coming from the south-west, as if to meet it, a great wave; it is described as a dark blue mass of water, 40ft. high, without crest or foam, rolling steadily on at the rate of about fourteen miles an hour. When it reached the island, which was between it and the town, it in a measure divided, one part rushing through the channel, and the other going round by the north, the whole volume appearing to join as it fell, and surged over the town and neighbouring beach. Among those who witnessed the scene from the bay, or from the high ground, the impression was general, that the whole place had sunk into the sea.

7. The time that the wave took to pass over the land was very short, but the destruction was complete, and as the sea went off to its original bounds, everything in the lower parts of the town was swept away. Machinery, houses, bags of ore, and merchandise all shared the same fate—were either sunk among the rocks, or floated away in the bay; and when the wave had passed, no traces were left to tell the people where their houses formerly stood. Providentially it was still daylight when the sea first went back, and many, taking the alarm, at once ran to the high ground; some, unfortunately, sought safety on the tops of their houses, and others delayed going until it was too late. About 150 people were swept off, and only two were picked up in the bay, a woman and a child. All the survivors passed that night on the sand, shocks of earthquake frequently alarming them; their greatest privation was the want of water, as there was none within forty miles, now that the stills had been destroyed.

8. The loss of property may be considered as over £500,000, almost entirely belonging to the English and other foreigners. A large quantity of valuable goods afterwards drifted on shore, but it was all plundered by the natives and soldiers. The merchant shipping in the bay almost entirely escaped the wave, one only that was in eight fathoms drove, but escaped the shore; they were all affected by the rapid eddies, and whirled round, but that was all.

9. Mexillones (*f*) is a small port twenty miles to the north of Iquique. There had been, close to the beach, a small village containing about two hundred inhabitants, who were employed in the exportation of nitrate, and there had been two large stores of merchandise; the shore is, like Iquique, barren and destitute of water. Either at the same time, or a little sooner, a catastrophe occurred

here similar to that at Iquique. First the earthquake, then the sea receded, to come back in a great wave that swept off all within its reach. The destruction was only very much less because there was less to destroy. The ground rises so abruptly from the shore that only a few steps were necessary to have placed the people who were on the beach in safety; yet between twenty and thirty were carried off and drowned. A considerable amount of property was also lost. The shipping in the bay suffered more severely than at Iquique; one large bark was dashed to pieces on the shore, and two others were seriously damaged by collision.

10. From Mexillones to Arica (*g*) the sea appears to have been moved with great violence, increasing towards Arica. The squadron, however, did not touch at any of the small ports between the two places, and as there are scarcely any Europeans on that part of the coast, it is almost impossible to obtain any reliable information of what happened.

11. The town of Arica is situated at the bottom of a valley, where there is a river and some vegetation; it had a population of 4,000 people, the streets were good, and there were several fine churches. The terminus of the railway, the custom-house, and private houses on the quay were perhaps the handsomest and most substantial of any buildings in Peru. Arica is the port not only of its own province, but also for the Republic of Bolivia, so that the custom-house and stores were seldom without a large deposit of goods. The railway ran conveniently along the quay from the station to the mole, and the transit of goods was well arranged, both in the town and to the interior. The trade was almost entirely in the hands of the English and other foreigners, who had much influence, and the hospital and all other public institutions requiring money and industry were left to them to support and manage.

12. It is stated in the journals that on the 13th of August, at Arica, the sea had a dull appearance, the air was unusually heavy, and that the gulls and other sea birds kept circling aloft with loud screams, and at last quitted the bay; I have, however, not met any one who noticed these unusual signs, and certainly no one was warned by them. The first shock of earthquake was felt at 4.45 p.m., and I shall perhaps give the best idea of what happened afterwards by telling the Vice-Consul's own story of how he and his family escaped. He said:—"When I felt the first shock I went to the room where Mrs. Nugent was, to tell her not to be alarmed, but as I got there a second one came, so violent that I carried off the children, and we all rushed out of the house. Scarcely had we reached the street when it all came down; everything around us was tumbling down, and my wife said, 'Let us go and stand on the ruins of our house, nothing can touch us there.' I had, however, long made up my mind that, if ever we had a severe earthquake, the sea would come in, and I said, 'Let us make for the high ground.' We passed up the centre of the street; everything in ruins, numbers of dead, and the wounded lying under the walls shrieking for assistance. Blinded with dust, and scarcely able

to breathe from the sulphur in the air, we stopped at the first rising ground. The whole town, with the exception of a few of the second storied houses, was shaken down. They stood high above the ruins. The quay and mole were crowded with people, who appeared to be panic struck, for the sea had gone out from the bay, and there was a great wave coming in; presently they took flight, but at least 200 of them were swept away. Wave succeeded wave at intervals of about a quarter of an hour, and long before dark there was not a vestige of the lower part of the town remaining. During all the night the shocks of earthquake continued, and the noise was like distant cannonading. The water in the few wells that could be got at was so hot (sulphuric) that it was quite undrinkable. So we passed the night on the hills."

13. There is very little to add to this account; the town was completely and utterly destroyed; even the two-storied houses, which, singularly enough, are left standing, are so shaken and cracked as to be quite uninhabitable. The waves had carried off the engines on the railway, and the iron columns of the custom-house, just like everything else, and not a trace was left of the first six miles of railway.

14. The destruction in the bay equalled that on the land; the six vessels that were at anchor were all lost. The *Fredonia*, United States storeship, and a merchant ship, having broken adrift, grounded near one another, in what had been seven fathoms water. A wave came in and broke them all to pieces; one man only, from the *Fredonia*, was saved out of both crews: two other merchant vessels were bilged or grounded, and then thrown high upon the beach, all hands drowned. The Peruvian corvette *America*, of 1,700 tons, broke adrift and was swept occasionally over the rocks near the island, and occasionally close to the beach, but for a long time she escaped; at last she grounded where there had been seven or eight fathoms water, and, falling over, broke her lower yards. Again she was carried out to sea, and it was not until after two or three more waves that she was lodged, broadside, on the beach; her foremast and sternpost gone, her captain, some officers, and forty men either killed or wounded.

15. The *Wateree*, United States' gunboat, double-ender, battened down and took every precaution that seamanship could suggest against the approaching danger. Unfortunately her boilers were out of repair, and she was unable to get up steam; one of her cables soon parted, and she was whirled round and driven about by each successive wave. Owing, however, to her peculiar build and light draught of water she still hung on to her other anchor, afloat and uninjured. It was not until some time after dark that one huge wave carried her off, and left her among the sandhills far from the beach. She was landed perfectly upright, without a scratch, and not a man was lost. With her square yards, ropes taut, and ensign and pendant flying, she now looks, apart from her situation, as serviceable as ever. The expense of getting this ship over more than 400 yards of difficult country, and then launching her through the surf, has determined the American admiral to offer her for sale, so that all her crew, except

the ship-keepers, have been taken out of her. The *America* will also be abandoned.

16. During the ten days that we have been on the coast of Peru there have been shocks of earthquake, averaging about two a day, and some of the captains of merchant ships have told me they have had them so violent at sea that the men have run up on deck thinking the vessel was on shore.

17. The effects of this earthquake have been felt along the whole coast, from 8 deg. to 42 deg. south latitude; and we have also heard that the island of Juan Fernandez was visited by the wave. Valparaiso and Cobija appear to have been less affected than any of the other ports.—I have, etc.

R. A. POWELL, Commanding and Senior Officer.

The Secretary of the Admiralty.

Valparaiso, August 17th.—Accounts from Talcahuano Bay state that from the effects of the late earthquake the sea rose considerably, causing much damage to the houses in Talcahuano *(h)*, inundating the lower part of the town, the wave extending some six miles along the low land towards Concepcion. A laden vessel, name not known, parted her cables and was lifted on to the rocks in Talcahuano Bay, and now lies in four feet water, abandoned by the crew. Another account states her to be either Italian or French. The effects of the earthquake have also been felt at Constitucion, but particulars have not yet been received. It is feared that more damage may have been sustained south of Talcahuano, but advices from the south of that port cannot be expected for some days.

To facilitate the finding of the places mentioned we annex their latitudes nearly, the coast lying nearly north and south. And the distance between the extreme points is about 800 English miles.—ED.

(*a*) Coquimbo, Chili	Lat. 29·9°
(*b*) Port Caldera, Chili	27°
(*c*) Copiapo, Chili	27·3°
(*d*) Iquique, Peru	20·2°
(*e*) Cobija, Bolivia	22·5°
(*f*) Mexillones, Bolivia	23·1°
(*g*) Arica, Peru	18·6°
(*h*) Talcahuano, Chili	36·7°

As nothing is said of Callao in the letter of Captain Powell, we annex the following extract concerning it.

The Earthquake at Callao.—Callao, Thursday, August 13th, 1868.—This evening, just as I was about mailing this letter for the steamer of to-morrow morning, at about five o'clock, the three most terrible and alarming shocks of an earthquake which have visited Callao in seven years were made manifest. For full five minutes, the heavy, rolling, rumbling shock continued, rocking the furniture, and even the houses themselves, with such violence that persons could hardly keep their feet, and an instantaneous rush was made for the street. Here the

sight beggared description. All the affrighted people kneeling and praying in the open street, crossing themselves, and falling in deep swoons full length on the pavement; old women kneeling with both arms upraised, screaming and crying, the great bell of Santa Rosa Church tolling and tolling, while the terrified people fled in crowds within the sacred enclosure, and the great steeple swayed and cracked as if every moment it would fall upon and crush the affrighted masses. As far as the eye could see down the long, narrow street, the very street itself rose and fell in long billowy undulations, while out in the bay, the ships tossed up and down under the violence of the tremendous internal jar. While I write thousands of the poor ignorant natives, Cholos, etc., are on foot and walking with all speed up to Lima, and the cars are so packed with human beings that a special train has been put on to accommodate those fleeing to Lima. The reason of this is the absurd rumour that the sea is coming in, and hundreds of people staud upon the mole, watching the ebb and flow of the tide, and insisting in their fear that the sea is rising and coming in. As Callao of old was destroyed, not by the ground opening, but by the sea uprising like a mighty mountain and overwhelming the place and people, so the horror and fright among the people is the second engulphing of the sea. Had the shock been as severe as it was protracted and incessant, every building in Callao must have been toppled down. The weather has been very cloudy the past few days, and the earthquake that has just shaken the solid earth (and the nerves as well) of Callao, is the most terrible one that has visited the place in seven years, and never one of such long continuance.

Callao, Friday, Nine a.m., August 14th, 1868.—Last night was the most fearful night of horrors that Peru has ever known. The sea was rising until midnight, and actually came in fifty feet over the mole, and submerged all the lower floors of the stores and buildings on the streets nearest the water. Ships lying at anchor broke their moorings and drifted into each other. The American man-of-war *Powhattan*, lying here, was run into by a ship, breaking the iron jib-boom of the *Powhattan*, and the *Powhattan*, as well as all the Peruvian men-of-war lying here, steamed up and went away out to sea. There seemed to be a regular under-current of whirlpool, so that ships went whirling round and round! Thousands of people walked the streets all night, and this morning the stores are closed, and Callao seems deserted. A feeling of terror prevails that this may be a second St. Thomas' affair; and if there should be another earthquake to-day, affairs would look dangerous. Ships are torn and battered, and the sea at the present writing boils and bubbles like a great whirlpool. Things look doubtful.

I write this as the mail closes, and have only a moment.

More recent accounts *by telegram* state the following to have occurred at San Francisco on the 21st of October:—The city of San Francisco was visited this day with a very severe shock of earthquake, which was felt throughout the whole of California and several of the neighbouring states. The town in many parts is a complete heap of

ruins, houses, stores, churches, and other buildings being razed. The lower part of the city has experienced the greatest amount of damage. The fissures left in the ground in many places are from seven to eight feet in width. The effect on the water in the bay was very striking, but as yet no word has been received relative to any damage to shipping. The loss of life is thought to be inconsiderable; but of course no correct idea can be formed as yet of the number of persons who are missing. The damage to property is estimated at over a million dollars.

The whole of this unlooked for event has been summarized in the following, by the representatives of the Peruvian Republic in Europe, and it is gratifying to be enabled to add that the sum of eleven thousand pounds has been sent out for the sufferers as the first instalment from this country for their relief, and six thousand more has been since collected.

"Gentlemen,—The Republic of Peru has been the victim of one of those great calamities with which Divine Providence in its inscrutable designs at times afflicts us. A frightful and indescribable catastrophe such as has been rarely recorded in the history of past ages, and never in that of modern times since the discovery of America, has destroyed a vast and important portion of that Republic. Terrible and prolonged shocks of earthquake, the violence of the sea, the overflowing of the rivers, and devastations by fire, have reduced to ruins cities, ports, towns, and villages, destroyed the crops, deposited vessels of considerable tonnage far inland, and terminated in the most frightful manner the lives of hundreds. Those who have escaped the fury of the elements wander in thousands about the country without house or home, without shelter, and suffering the torments of hunger and thirst in consequence of the destruction of the crops, and the disappearance of the streams which followed their overflow. Vain would be the attempt to describe the picture presented by an important part of Peru, and expressions are wanting to convey an idea of the scene. The government of the Republic and the inhabitants of the towns which have not suffered by the catastrophe are exerting themselves to the utmost and employing all human means to alleviate as far as possible the misfortunes of the unhappy inhabitants of the south coast, and in this work of humanity they are ably assisted by the representatives and citizens of foreign countries who are resident in Peru. The undersigned justly consider that the Peruvians, Americans, and citizens of other nations who have lived in or had any connections with Peru, will feel real satisfaction in co-operating to render less bitter the misfortunes of the unhappy victims of the catastrophe of the 13th of August, and have the honour to address you, invoking the sentiments of your patriotism and charity, and affording you the opportunity of contributing to this humane and philanthropic cause. With the assurance of not having addressed you in vain, they take this opportunity of anticipating in the name of the government of the Republic of Peru and of its inhabitants, their sincere gratitude, and personally the assurance of their consideration and respect."

Nautical Notices.

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

Particulars of Lights Recently Established.

(Continued from page 571.)

Name.	Place.	Position.	F. or R.	Ht. in Ft.	Dist seen Mls	[Remarks, etc. Bearings Magnetic.]
89. Buoys:—	Alteration	of System	...	...	...	See Notice No. 89.
90. Smith Point	Chesapeake Bay	Edge of shl.	F.	37	11	Est. 9th September, 1868. Screw piles with Fog Bell.
Bull's Bay	Bull Island	North end	F.	...	...	Re-established 31st August, 1868.
91. Cuba, N.E. end	Lucrecia pt.	21° 4·6′ N. 75° 37·6′ W.	R.	130	17	Est. 10th October, 1868. *Red.* Interval of rev. one minute.
92. Spithead ent.	Wreck buoy	...	...	...	...	See Notice No. 96.
93. Civita Vecchia	Ent. to port	End of bank	...	...	...	Beacon: a ball on a pole, to be left on starboard hand entering
Breakwater	Santa Venera	Gulf St. Euphonia	F.	...	...	Red, on extremity of works of Breakwater.
94. Buoy: Ridge Bank	Near South Rock Lt.	Cy. Down	...	...	...	
95. Pt. Nicholson New Zealand	Somes Is.	...	F.	74	10	Est.—Shows *white* to mid channel, to west shore *Red*, to eastern shore *green*, entering. See Notice No. 95.
96. Spithead ent.	E. Channel	...	F.	...	...	Light Vessel, temporary. See Notice No. 96.
97. St. Patrick Rocks	Killala Bay	Outer E. rk.	...	...	...	Also an iron staff bearing a cage 30ft. high. See Notice No. 97.
98. Helgoland B.	North Sea	Loreley Bnk.	...	...	...	See Notice No. 98.
99. Herault R., South coast of France	Ent. W. jetty head	43° 16·8′ N. 3° 26·5′ W.	F.	41	7	Est. 15th September, 1868. *Red.*
Cape Matifou	Algeria	36° 48·7′ N. 3° 14·9′ E.	F.	242	10	Est.—October, 1868. 8¼′ E. of Algeria Light.
Cape Casino	...	36° 48·7′ N. 2° 58·7′ E.	R.	210	25	Est.—September, 1868.
Tipaza	...	36° 35·8′ N. 2° 28·3′ E.	F.	102	8	Est.—September, 1868.

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

No. 89.—The Trinity House, London, has given Notice, that during the month of March, 1869, it is intended to alter the Buoyage between the North Foreland and Beachy Head, on the system adopted by the Trinity House, with the approval of the Board of Trade, and concurred in by the Admiralty.

The leading principles of this system are, that the starboard side of channels, entering, will be marked by *black* or *red* buoys only, and the port side by *black* or *red* buoys *chequered* or *striped vertically* with *white*. Middle grounds will be marked by *black* or *red* buoys with *white bands* or *horizontal stripes*. It is to be observed that *only one colour*, either *black* or *red*, will be used in the same channel.

When beacons are considered necessary to be placed on the buoys, the starboard side, entering, will be distinguished by *globes*, the port side, entering, by *cages*, and the middle grounds, by *triangles* or *diamonds*.

The alteration in the character of the buoys will be as follows:—

Names of Buoys.	Present Character of Buoys.	Intended future character of Buoys.	Names of Buoys.	Present Character of Buoys.	Intended future character of Buoys.
Long Nose	Red	Black and white striped vertically.	Bunt Head	Black and white bands	Black.
Elbow ...	Red and white chequered, with globe ...	Black and white striped vertically, with cage	N.E. Goodwin ...	Red with triangle	Black and white striped vertically (no beacon)
Broadstairs Knoll ...	Black	Black and white chequered.	E. Goodwin	Black with diamond	Black and white chequered with St. Andrew's cross.
Gull	Red and white bands (can)...	Black and white chequered (conical.)	S.E. Goodwin ...	No alteration...	
North Bar	Red and white striped vertically	Black and white bands.	S. Goodwin	Black, with globe	Black and white chequered, with cage.
Nth. Brake	Red	Black and white striped vertically.	Dyke and Quern ...	No alteration...	
Mid. Brake	Red and white chequered ...	Black and white chequered.	Red Fairway ...	Red	Red and white striped vertically.
Sth. Brake	Red with globe	Black and white bands, with triangle.	Chequered Fairway	Black and white chequered ...	Red and white chequered.
Deal Bank	Red	Black and white chequered.	S. Fairway	Black and white striped vertically	Red and white striped vertically.
Goodwin Knoll ...	Black	Black and white bands.	Varne ...	No alteration...	
N.W. Goodwin ...	Black and white striped vertically	Black.	Roar Spit...	Black	Black and white chequered.
N.W. Bunt	Black and white chequered (conical) ...	Black (can).	Royal Sovereign	Black, with globe	Black and white striped vertically, with cage

No. 95.—The light is intended as a leading light for vessels entering the main channel of the entrance, and in clear weather should be seen from a distance of ten miles, or four miles outside Pencarrow Head light.

From the lighthouse the centre of Ward Island bears S.S.E. $\frac{1}{2}$ E.; Pencarrow Head S. $\frac{1}{2}$ E.; Steeple Rock South; Halswell Point S.W. $\frac{1}{2}$ S.; and Jerningham Point S.W.

Caution.—When entering the port through the main entrance, the

white light should not be shut in after bringing Pencarrow Head light to bear E.N.E.

All Bearings are Magnetic. Variation 15° 40′ *Easterly in* 1868.

No. 96.—With reference to Notice to Mariners, No. 92, Notice is hereby given that a temporary light vessel has been moored 40 fathoms S.S.E. of the wreck, and will exhibit a *fixed* white mast-head light.

From the temporary light-vessel. the Nab light bears S.W. ½ S., $1\frac{8}{10}$ miles nearly; and the Warner light N.W. $\frac{5}{6}$ N., 1½ miles.

A wreck buoy (green) has been placed about 20 fathoms on the north-west side of the wreck, which lies across the Channel in about a N.E. and S.W. direction.

All Bearings are Magnetic. Variation 20° 40′ *Westerly in* 1868.

No. 97.—Bearings from the stone beacon, the extreme of Kilcummin Head N. $\frac{5}{8}$ W., and the ruins of Castlenageeha W. $\frac{1}{8}$ N.

A perch, consisting of an iron staff surmounted by a cage 30 feet above high water, stands on the eastern part of the inner or southernmost of St. Patrick's Rocks, with the stone beacon on the outer rock N. $\frac{3}{4}$ W., seven-tenths of a mile; and the Round Tower at Killala S.W. by W. ½ W.

Leading Marks for Crossing Killala Bar.—*Caution.*—In consequence of the washing away of the southern part of the Sandy Point of Ross, the leading mark given on the Admiralty chart (No. 2767), viz.: "Three chimney cottage over the middle of Sandy saddle," is no longer available; and the mark now in use is so difficult of recognition by a stranger, as to render it unadvisable to enter the river without the assistance of a local pilot.

All Bearings are Magnetic. Variation 26° 30′ *Westerly in* 1868.

No. 98.—Loreley Bank, *East of Helgoland*, about 3½ miles eastward of Helgoland, has been examined by Captain Grabow, commanding His Prussian Majesty's steam vessel *Loreley*, who reports that:—

The shoalest part of it is about 8 fathoms across, with the depth of $3\frac{3}{4}$ fathoms. Southward, the water deepens abruptly, and northward, a depth of 4 and 5 fathoms extends for nearly half a mile. From the shoalest part of it, the north-west beacon on Sandy Island is in line with Helgoland Lighthouse, bearing W. $\frac{3}{8}$ N., distant $2\frac{3}{4}$ miles.

All Bearings are Magnetic. Variation 16° 50′ *Westerly in* 1868.

Notes of Novelties.

Statesmen have been lately enquiring whether some kind of medium could not be devised of settling differences between States, before they ripen into war, so as to avert the calamity of two countries tearing each other in pieces. The following might be classed as ministering to justice without war.

The Alabama Again.—A suit has been commenced in the United States District Court against Mr. Laird, the builder of the *Alabama*, by the owners of the *Sonora*, one of the vessels which she destroyed. It is claimed that the *Alabama* was fitted out in violation of law, and that her owners and builders are liable for damages sustained at her hands. The amount claimed is 119,000 dollars, or £23,800.—*Express.*

On Correcting the Longitude for an Error in the Latitude.

It is sometimes convenient to compute the longitude by chronometer with the D.R. latitude, in order to obtain an approximate position. Supposing the latitude thus used to have been erroneous, the accompanying table is intended to supply a correction which will reduce the longitude to what it would have been, if computed with the true latitude at the time of sights. It is purposed in a future communication to show its use in finding a ship's position by one, and also by two chronometer observations.

A. C. Johnson.

Dartmouth, October 21st.

TABLE

For correcting the Longitude for an error in the Latitude.

HOUR ANGLE AND DEPARTURE.									ALTITUDE.			
H.A.	Log.	Dep.	H.A.	Log.	Dep.	H.A.	Log.	Dep.	ALT.	Log.	ALT.	Log.
h. m.			h. m.			h. m.						
1. 0	293	3·7′	2. 0	150	1·7′	5.20	003	0·2′	6°	999	36°	954
1. 4	280	3·5	2. 8	138	1·6	5.45	001	0·1	8	998	38	948
1. 8	267	3 3	2.16	126	1·5	6. 0	000	0·	10	997	40	942
1.12	255	3·1	2.24	115	1·4	DECLINATION.			12	995	42	935
1.16	244	2·9	2.32	105	1·3				14	993	44	928
1.20	233	2·7	2.40	096	1·2	Dec.	Log.	Dec.	Log.	16	991	48	913
1.24	223	2·6	2.48	087	1·1					18	989	50	904
1.28	213	2·5	2.56	079	1·0	0°	0	17°	10	20	986	52	895
1.32	204	2·3	3.12	064	0·9	5	1	18	11	22	984	54	884
1.36	195	2·2	3.28	052	0·8	8	2	19	12	24	980	56	874
1.40	187	2·1	3.44	041	0·7	9	3	20	13	26	977	58	862
1.44	179	2·0	4. 0	031	0·6	12	5	21	15	28	973	60	849
1.48	171	2 0	4.16	023	0·5	14	6	22	16	30	969	62	836
1.52	164	1·9	4.40	013	0·4	15	7	23	18	32	964	64	821
1.56	157	1·8	4.56	008	0·3	16	8	24	19	34	959	66	807

EXPLANATION.

Add together the logs. of the hour angle, declination and altitude, rejecting the fourth figure in the sum, and take from the first part of the Table the departure corresponding to the result. Turn this dep. into diff. long. by the Traverse Table, and multiply it by the number of miles in the error in latitude; the result will be the correction for longitude; which apply thus:—Having noted the quarter in which the Sun bore at the time of observation, place the opposite bearing under it, and connect the latter denoting the name of the correction for latitude with that diagonally opposite to it: the latter will be the name of the correction for the longitude.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

DECEMBER, 1868.

The Bane without its Antidote.

When Columbus, under the delusion of having discovered the shore of Asia, sent his messengers from the port of Mares in Cuba *to report his arrival to the great khan of Cathay (or China)*, he had gained the western extreme of his first voyage; and had refrained from going further, because he was impressed with the idea that the coast there trended to the northward, and would expose him to the cold of a climate which from his experience of an Arctic voyage, he had determined to avoid. Those messengers consisted of two Spaniards, learned in geographical matters of the day, also two natives of Guanahani, his first discovered island, and another native of the port of Mares, the latter possibly adopted as a guide from being in some degree acquainted with the nearer towns of the island. They were allowed six days for their journey, starting on the 2nd of November, 1492, but having been absent only four days they returned to Columbus, and much disappointed him with the account of their journey, yet, although they were not able to confirm his favourite but mistaken ideas in the point of geography, they were the bearers of a piece of intelligence which while it seemed to be of no special importance in the mind of the great Admiral, is generally allowed to have foreshadowed the wide-spread use of that magic plant called tobacco! We are told that:—

"In the course of their journey they witnessed for the first time the application of tobacco to smoking. This was described as being in the form of a roll of a large quantity of the leaf, one end of which was on fire, the smoke being inhaled by the mouth from the other, a process which naturally occasioned considerable surprise to the Spaniards. Thus, says Navarrate, was the first lesson given to Europeans of this extraordinary habit, which has become universal;

simple contrivance. Yes, I say *simple*, for nothing offends the eye of an old sailor more than fancied complication;—but in Welsh and Bourchier's plan there really is no complication. I must, however, confess to have muttered the word when I first saw the buoy in the water (it was hardly fair though).

I afterwards had the model in my own hands and carefully examined every part. How the inventors conceived the notion of those "telescopic masts" puzzles me sadly (for such they are literally). But all is snug and handy: portfires—signals—fresh water—all is well arranged, and I don't see how it can fail.

There is one thing perhaps which a grumbler (should even there be one in Her Majesty's sea service) is likely to cavil at; that is, its shape—a square: but all things considered (such as snugness when hoisted, etc.) it is best as it is. I certainly, at first, heard two or three doubts expressed as to the stability of the buoy when resting on the water: and this (by the way) reminds me of a serious mistake accidentally made by your printer in his reading of my letter,—he makes me talk about the "*trembling*" ocean surface! (These landsmen do sometimes make a hash or lobscouse of it.) I never said so! Who ever saw the ocean tremble? Why, sir, I said *tumbling*, and when we are considering ocean life-buoys, I think this tumbling of the waves ought not to be overlooked. Let me assure you in all honesty that this life-buoy is just such a thing as I should desire to catch hold of, if unfortunately my venerable self were ever to be unceremoniously handed over to the laws of gravity above a *tumbling* sea!

It was perhaps *I* who "trembled," sir, (if you like)—both for the buoy and for the hopes of the inventors, when I saw a big burly something in tarpaulins, standing six feet high in his shoes, with his wide-awake lashed down to his chin with spunyarn, suddenly stoop and roll off the quay into the basin for the pleasure, I suppose, of getting on board of a craft only three feet six inches in length and beam, with "two telescopic masts," and smart red flags thereon!

I thought it all over with Messrs. W. and B. when this great long fellow seemed to me to be ambitious of touching the truck of the one mast he had clutched at; for his grasp became higher and higher. But how green I must have been! of course this was all a scheme to shew off the buoy's stability!

Well, sir, give the ——, give every one, his due, even the jolly old tar:—as the fellow reached hand over hand, higher and higher up the mast, it became at last like trying his hardest to heave down the life-buoy with a handspike—and yet the little craft was as stiff as, perhaps not the *Irish* Church just now, and finding it to be so, the rough old fellow looked around, giving us all a knowing wink, with evidently a leering challenge to "beat that now will ye?" and down he slipped, grimly smiling, on to the deck, and sat himself down dangling his legs in the hold, eyeing the mouth piece of a small tube as if it suggested something, or as if that too needed a trial of the contents of the tank intended for fresh water. I thought it a pity the old fellow had not something in the tank by which to have drunk our gracious Queen's

health on board the *smallest two-masted ocean* vessel ever afloat! He might have been none the worse (wet and cold as he was) to have drunk success to the inventors, for 'pon my word they deserve it.

I have, etc.,

October 15th, 1868. HOLYSTONE EYE.

ISLANDS IN THE PACIFIC OCEAN.

POSITIONS OF THE CAROLINE GROUP.

(Concluded from page 565).

Names.		Lat. N.	Long. E.	Authority.
Namolipiafane Atoll ...	N.E. islet	8° 34′	152° 01′	Lutke's Chart.
	S. islet	8 25	152 50	„ „
	S.W. islet	8 30	151 42½	Lutke in Findlay.
	centre	8 32	151 54	Spanish Chart.
Faiu Atoll (east) or Lutke's Island	centre	8 33	151 27	Lutke's Chart.
Fahieu Oriental	centre	8 30	151 23	Spanish Chart.
Namonuito or Anonima Atoll	N. islet	9 00	150 14	Lutke's Chart.
	E. islet	8 34	150 32	„ „
	W. islet	8 35	149 47	„ „
Namonuito (Triangular)	S.E. pt.	8 30	150 35	Spanish Chart.
	SW. pt.	8 32	149 49	„ „
	N. pt.	8 58	150 19	„ „
Tamatam Atoll or Martyr's Islands	S. islet	7 32	149 29	Duperrey's Chart.
Tamatam or Ollap Atol...	centre	7 35	149 27	Spanish Chart.
Puloat or Kata Islands (2)	centre	7 19½	149 17	Freycinet, Findlay.
	„	7 20	149 14	Spanish Chart.
Luk or Ibargoita Island...	centre	6 40	149 08	Freycinet, Findlay.
	„	6 40	149 23	Capt. Cheyne.
Pulo Suge, bank and Island	...	6 43	149 29	Spanish Chart.
Pikelot or Coquillo Island	centre	8 12	147 40	Duperrey's Chart.
Biguela Island	centre	8 12	147 39	Spanish Chart.
* Pikela or Lydia Island..	centre	8 38	147 13	Duperrey's Chart.
Satawal or Tucker's Island	centre	7 21	147 06	„ „
Satahoal or Tucker's Island	centre	7 20	147 07	Spanish Chart.
Faiu (west)	centre	8 03	146 40	Lutke's Chart.
Fahieu Occidental reef ...	centre	8 02	146 49	Spanish Chart.
Oraitilipou bank, doubtful, between Pikelot and Faiu, W., 11 fathoms over it.				
Lamotrek or Swede's Island	centre	7 29	146 28	Lutke's Chart.
Lamurreo Atoll	centre	7 30	146 29	Spanish Chart.
Elato or Haweis Island ...	N. point	7 29	146 19	Lutke's Chart.
Elato or Namoliaur Atoll	centre	7 28	146 19	Spanish Chart.
Olimaras Islands.....	centre	7 43	145 57	Lutke's Chart.
Olimaras Atoll.....	centre	7 40	145 57	Spanish Chart.
Faraulep or Gardener's Island	centre	8 34	144 37	Lutke's Chart.

* Not on the Spanish Chart.

Names.		Lat. N.		Long. E.		Authority.
Farroilep Atoll	centre	8	48	144	36	Spanish Chart.
Ianthe shoal.....	centre	5	53	145	39	Cheyne, 8 ft. w'r.
Falipi bank	centre	5	53	145	39	Spanish Chart.
Ifalik or Wilson's Island...	centre	7	15	144	31	Lutke's Chart.
Ifeluc Island	centre	7	10	144	39	Spanish Chart.
Wolea or Thirteen Islands	E. pt.	7	21	143	58	Lutke's Chart.
„ entrance to lagoon	...	7	15	144	02	Capt. Cheyne.
Ulea Atoll	centre	7	20	143	56	Spanish Chart.
Eauripik or Kama Islands	centre	6	39	143	11	Lutke's Chart.
Eurupig or Kama Islands	centre	6	38	143	09	Spanish Chart.
Sorol or Philip Island ...	centre	8	06	140	52	Lutke's Chart.
Sorol Oriental Island.....	centre	8	05	140	49	Spanish Chart.
Fais or Tromlin's Island	centre	9	46	140	36	Lutke's Chart.
Feis Island	centre	9	45	140	37	Spanish Chart.
Uliti or McKenzie's group	N.p. of E. islet	10	06	139	47	Lutke's Chart.
„ „ Falalep	centre	10	02	139	50	„ „
„ „ ...	S. pt.	9	47	139	35	„ „
Ulevi Atoll or McKenzie's group.....	S. islet	9	47	139	35	Spanish Chart.
Or Egoi Atoll, W. group...	centre	10	00	139	43	„ „
„ E. group ...	centre	9	50	139	59	„ „
Hunter's shoal.....	centre	9	57	138	13	Findlay, 8 fathoms.
	„	9	57½	138	29	Doubtful Spanish Chart.
Eap Island	S. pt.	9	25	138	00	D'Urville's Chart.
	N. pt.	9	40	138	00	„ „
Uyap Island	centre	9	30	138	09	Spanish Chart.
Ngoli or Lamoliork Atoll	S. islet	8	17	137	33	Capt. Cheyne.
	NE. is.	8	35	137	40	„ „
	Mid. is.	8	30	137	25	D'Urville's Chart.
Ulu or Lamoliaur Atoll...	centre	8	20	137	34	Spanish Chart.
Palau-Pelew or Arecifos Is.	S. pt.	6	55	134	05	D'Urville's Chart.
„ Augour Island ...	centre	7	35	134	30	„ „
„ Kyangle Island...	„	8	08½	134	35	Capt. Cheyne.
„ Pellelew Island...	S. pt.	6	58	134	13	Raper in „
Babeldsuap or Pelew Islands and reef	NW. end of reef	8	40	134	09	Spanish Chart.
Kianguel Island	centre	8	10	134	45	„ „
Babeldzuap, W. side	centre	7	36	134	19	„ „
„	N.E.pt.	7	55	134	54	Ex. reef from N.E. point of Babeldzuap Islands ex. to N.W.
Augour Island.....	centre	6	51	134	14	
Pellelew Island	S. pt.	6	58	134	24	
Sousorol or St. Andrew's Island	centre	5	20	132	16	Horsburgh's Directory.
Sonrol or St. Andrew's Is.	centre	5	19	132	14	Spanish Chart.
Codocopuey Island	centre	5	15	132	14	„ „
Anna or Current Island...	centre	4	38½	132	03½	Horsburgh.
Anna or Pul Island	centre	4	38	132	09	Spanish Chart.
Merir or Warren Hastings Island	centre	4	17½	132	28½	Horsburgh.
Pulo Mariera Island	...	4	12	132	27	Spanish Chart.
Tobi or Lord North's Isl.	centre	3	03	131	20	Horsburgh.
Lord North's Island	centre	3	03	131	09	Spanish Chart.
Helena shoal	centre	2	50	131	41	Horsburgh.
St. Felix or Carteret bank	centre	2	48	131	41	Spanish Chart.
Matelotas (3 is.) or Sequeras	centre	8	40	131	34	„ „
Pegan Atoll.....	centre	0	50	134	19	„ „

Notes of Novelties.

The following is stated to be the projected cruise of H.M.S. *Galatea.*

According to present arrangements, the *Galatea*, 26, wooden screw frigate, under the command of Captain His Royal Highness the Duke of Edinburgh, will leave Plymouth on the 1st November, to complete the programme so unexpectedly brought to a close by the attempt on his royal highness's life last year. The original programme of the second voyage has been to some extent altered, the intention to visit the islands in the Pacific, and to proceed northward as far as Vancouver's Island, having been abandoned. On leaving Plymouth the ship will proceed to the Cape of Good Hope, calling at Madeira *en route*. She is expected to arrive at the Cape by the end of December; and after remaining there a few days, will sail for Swan River, Western Australia, where she is timed to arrive by the close of January, 1869. Early in February she will leave for Sydney, calling at Adelaide and Melbourne, which will occasion a delay of probably eight or ten days; and about the middle of March she will continue her voyage to Wellington and Auckland, New Zealand, arriving at the former port about the end of the month. The *Galatea* will remain there a short time, and is appointed to leave Auckland towards the close of May for Yokohama, in Japan, the distance being 5,000 miles; and she will probably reach the latter port by the end of June. She will then return by way of the Gulf of Pechili, Hong Kong, Manilla, Singapore, and Penang, and proceed to Calcutta, where she may be expected to arrive by the end of October. On leaving Calcutta the *Galatea* will continue the return voyage, calling at Trincomalee, Point de Galle or Colombo, proceeding thence by way of the Mauritius to the Cape of Good Hope, which port she will again reach by the middle of April. After leaving the Cape she will call at St. Helena, and is expected to arrive in England at the close of July, 1870. The cruise of the *Galatea* will thus extend over a period of one year and ten months, and by the time the ship again reaches an English port she will have covered a distance of upwards of 39,000 miles.—*Daily News.*

Interesting Experiment at H.M.'s Dock-yard, Devonport.—H.M.'s iron ships *Warrior* and *Defence*, were taken into dry dock at Keyham a few days since to examine their bottoms, in order to test the economical merits of two rival compositions for protecting the plates and rivets and preventing fouling. We understand that the more economical composition of Messrs. Peacock and Buchan had been on the bottom of the *Defence* about twelve months, whilst the copper preparation of Mr. Hay, called the maritime improvement, had only been on the *Warrior* some seven months. The surface of the *Warrior's* bottom was studded with gooseneck barnacles of large size, whilst that of the *Defence* was free from them, although the two ships had been cruising in company, and the *Defence* about five months longer afloat. This extraordinary result is looked upon as very satisfactory for the

future economy of dock-yard expenditure in this respect; but another trial will be made before deciding which composition will in future be adopted in the navy. No less than thirty-one other descriptions of compositions have been tried on different ships, and the final trial would appear to be between the two above named competitors. The *Morning Advertiser* of the 16th October, says:—Messrs. Peacock and Buchan, the well-known inventors and manufacturers of this successful composition, have been awarded a silver and a bronze medallion by the jurors of the Royal Havre Exhibition. [We congratulate these gentlemen on their well merited reward.]

Swift Travellers.—On the morning of Oct. 15th, Mr. Popplestone, the station-master at Starcross, Devonshire, received from London per rail in a tin box, six carrier pigeons, which had been sent by a member of a London Pigeon Club, with the request that the birds might be set at liberty the same morning at 9.30. The request was complied with. The birds hovered over the Exe estuary, flying round and round for the purpose of ascertaining their whereabouts, and then darted off in the direction of Woodbury-hill, across which they were seen winging their rapid flight. Mr. Popplestone received a letter from the sender of the pigeons on the 19th, stating that one bird returned to its loft at Clerkenwell at 1.35 p.m. on the 15th, four others were found in the loft at two o'clock, and the last made its appearance a few minutes later. The pigeons were only six months old. Between London and Starcross the distance by road is about 180 miles, which one of the pigeons must have accomplished in little over three hours and a half.

It was once proposed to turn to account the wonderful faculty of these birds returning to their homes, and thus to send home intelligence from our Arctic voyagers. But the fact that they do not fly by night at once set the subject aside.

There is one purpose and that possibly a useful one which abandoned merchant ships serve when being left to float about the surface of the ocean, and the following is an instance of one being at present devoted to this very laudable purpose, although perhaps unintentionally. The two following extracts concerning the *Disraeli* appear in the *Daily News* of the 21st and 27th of October—

On the 28th September, during a heavy gale, fell in with a ship with a flag of distress flying. Remained by her, and next morning, the weather having abated, took off all the crew, sixteen in number. The vessel proved to be the *Disraeli*, bound from Bathurst (Canada), with a cargo of deals. The crew were afterwards landed at Dover.

The Disraeli again.—Our shipping intelligence again bears witness to the misfortunes of this ill-fated craft. From Havre we have the following:—"The derelict vessel *Disraeli*, from Bathurst, R.G., to Belfast, was passed in lat. 45 N., long. 23 W., by the *Kate Smith*, arrived here." This report is dated October 23rd; it is, however, about the 23rd of November that news of this hulk will be most eagerly looked for.

The following is a list of rewards for gallantry in saving life at sea, given by the Board of Trade, September 19th, 1868, for services to shipwrecked seamen, and have lately been presented to them :—

The President of the United States has awarded to Captain Joseph Carruthers, of the ship *Jalawar*, of Liverpool, and to Captain Samuel John Cole, of the barque *Malvern*, of Sunderland, a gold watch each, in testimony of their services in rescuing the Crew of the American ship *Wm. B. Dinsmore*, of Boston, from the burning wreck of that vessel on 8th July, 1867.

The Board of Trade have awarded—

To Mr. Frank Gedge, Second Mate of the *Countess of Ripon*, a gold watch, for his exertions in saving life on the occasion of the wreck of that vessel in 1866.

To Mr. Robert Francis Nepew Banks, Master of the *Childwall Abbey*, a sextant, in testimony of his humanity to the Master and Crew of the *Hornet*, of London, which was destroyed by fire on the 30th September, 1867.

To Mr. John Meldrum, Master of the *Swanley*, of London, a telescope, in testimony of his services in rescuing the Crew of the *Jane*, of St. John (N.B.) on the 14th April, 1868.

To Mr. Eli Curtis, Master of the *Sunderland*, of Jersey, a binocular glass, for his services in rescuing the Crew of the *Arbutus*, of St. John (N.B.), on the 22nd May, 1868.

Loss of the Barque Oceanica.—On Sunday, October 18th, about six o'clock p.m., when the mail steamer *Mandingo*, from the West Coast of Africa, was off the Great Ormshead, Captain Lowry fell in with the barque *Oceanica*, in a sinking condition. The *Oceanica* left Liverpool on Saturday last for Miramichi, and was left off Holyhead the same night by the steam tug *Tartar*. Although the vessel was leaking when she left the dock the captain proceeded on his voyage. By the time she had reached the Irish coast the water gained rapidly, and the master determined on putting back. The *Oceanica* was doing so when she was sighted by the *Mandingo*, which at once bore up for the distressed vessel. On coming alongside, and whilst in the act of clearing away a hawser to send on board, the *Oceanica* gave a plunge forward, and went down instantly, head foremost. By the prompt action of those on board the *Mandingo* every person belonging to the ill-fated vessel was saved. The crew were eleven in number, and saved nothing but what they stood in, the captain only saving his chronometer. The *Oceanica* was owned in Belfast by Messrs. J. Lemon and Co , and was commanded by Captain Wright. Had the *Mandingo* not hove in sight at the time, or even had it been dark, it is feared that Captain Wright and his crew would have shared the fate of their vessel. Great praise is due to Commander Lowry, his officers, and crew, for the gallantry displayed in saving the crew of the *Oceanica*.

While the loss of this vessel is an instance of the kind of *sea-*

worthiness in which an English merchant ship may be sent to sea, her loss was the occasion of that gallantry for which British seamen are celebrated.

Notes of Nautical Gallantry.

Gallant Conduct of a Young Naval Officer.—On the night of the 1st of June last, while her Majesty's sloop *Myrmidon* was lying in Banana Creek, River Congo, Western Africa, an able seaman, named Torrance, fell overboard. Sub-Lieutenant Lionel De Sausmarez was officer of the watch, and though a strong current was running at the time, and the river is infested by sharks, this gallant young officer, with the utmost promptitude, jumped overboard, laid hold of the drowning man, and swam with him to the pier, supporting him until assistance came. As the man could not swim there is no doubt that he owes his life to the courage of Mr. De Sausmarez, and such conduct will probably be noticed in the proper quarter.

NOTICES TO CORRESPONDENTS.

"H. S.," just received—Will appear in our next. Also "Our Bane without an Antidote."

WANTED.—The numbers of the *Nautical Magazine* for the months of March, April, and May, 1867, for copies of which the Publishers will give full price.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, *in October*, 1868.—*Sold by the Agent, J. D. Potter*, 31, *Poultry, and* 11, *King Street, Tower Hill, London.*

102 Atlas m = 1·5 England East Coast, Pakefield Gatway to Orfordness. Staff-Commander Calver, R.N. 1868. 2s. 6d.

157 DEm = 0·27. Italy, West Coast, San Remo to Cape Cavallo, 1868. 2s. 6d.

165 DEm = 6·3. Sardinia, South part, to Malta, including Sicily island, 1868, 2s. 6d.

545 DEm = *various*. Magellan Strait Anchorages, Royal Road and Elizabeth Island, Sandy Point, with Views, and Gregory Bay. Captain Mayne, R.N., C.B. 1868. 2s. 6d.

942 a, b DEd = 2·75. Eastern Archipelago, Sheets 3 and 4, including Flores, Banda, and Arafura Seas, *various*, to 1868. 5s.

1010 $\frac{DE}{2}$ m = 1·5. Cochin China, Cham-Collao and entrance to Fai-foh River, with Views, *French* Survey. 1867. 1s. 6d.

EDWARD DUNSTERVILLE, *Commander, R.N.*

Admiralty, Hydrographic Office, 20th October, 1868.

THE

NAUTICAL MAGAZINE

AND

NAVAL CHRONICLE.

DECEMBER, 1868.

The Bane without its Antidote.

When Columbus, under the delusion of having discovered the shore of Asia, sent his messengers from the port of Mares in Cuba *to report his arrival to the great khan of Cathay (or China)*, he had gained the western extreme of his first voyage; and had refrained from going further, because he was impressed with the idea that the coast there trended to the northward, and would expose him to the cold of a climate which from his experience of an Arctic voyage, he had determined to avoid. Those messengers consisted of two Spaniards, learned in geographical matters of the day, also two natives of Guanahani, his first discovered island, and another native of the port of Mares, the latter possibly adopted as a guide from being in some degree acquainted with the nearer towns of the island. They were allowed six days for their journey, starting on the 2nd of November, 1492, but having been absent only four days they returned to Columbus, and much disappointed him with the account of their journey, yet, although they were not able to confirm his favourite but mistaken ideas in the point of geography, they were the bearers of a piece of intelligence which while it seemed to be of no special importance in the mind of the great Admiral, is generally allowed to have foreshadowed the wide-spread use of that magic plant called tobacco! We are told that:—

"In the course of their journey they witnessed for the first time the application of tobacco to smoking. This was described as being in the form of a roll of a large quantity of the leaf, one end of which was on fire, the smoke being inhaled by the mouth from the other, a process which naturally occasioned considerable surprise to the Spaniards. Thus, says Navarrate, was the first lesson given to Europeans of this extraordinary habit, which has become universal;

and hence the origin of the so much prized and so far celebrated Havanas. The natives on being questioned why they followed the practice, replied, as well as they could be understood, that it prevented them from feeling fatigue. Las Casas, the Spanish historian, is the first to exclaim against the practice, and says for his part, he cannot see what benefit can be derived from it. But Navarrate inadvertently supplies an excellent answer, one that applies to other states besides that of Spain, in simply observing 'who would have supposed that this new and curious vice could have become so general as to be one of the most profitable *sources of revenue* to the state.'" *

This after all appears to be the most *beneficial* result of the use of the weed in all the various ways in which it is applied. Although we have on several occasions in the progress of this journal collected some interesting particulars on the subject of *the weed*, we propose here to throw together the various accounts that we have collected along with something more of its modern history, and opinions concerning its injurious qualities on those who are led to patronise it. We have quoted above the first appearance of it in this our western world, we shall find in the sequel what was earlier known of it in the eastern.

There can be no doubt that any attempt to arrest the astonishing headlong progress which the enticing habit of the immoderate use of tobacco has made of late years, and the enormous consumption of it at present by Her Majesty's subjects, would be about as fruitless as an attempt to arrest the progress of a volcano, or to stop that of an avalanche. Still we shall not fail to show some of the effects of the habit of using it and how easily that habit is acquired.

Among the notes which we have preserved concerning smoking tobacco it is said, "this smoking of tobacco is one of those acquired habits which has often perplexed us to imagine the advantage of undergoing the ordeal. However there is no accounting for taste, and we must confess to as great a horror of the weed as honest old Stowe, who, in his chronicles of England, in speaking of tobacco calls it, "that stinking weede, so much abused to God's dishonour, was first brought into this land by Sir Walter Raleigh or Sir John Hawkins, as some say about the year 1565, but not used by Englishmen in many years after, though at this day, 1631, commonly used by most men *and many women*." †

* Landfall of Columbus.

† In a work republished by the Hackluyt Society, entitled "The Discovery of the large, rich and beautiful empire of Guiana, etc., performed in the year 1595, by Sir W. Raleigh, Knight," we read, "It has been observed by Southey that it is not the least remarkable circumstance, that although Raleigh's colonial enterprises were unfortunate, they should incidentally have produced consequences of great benefit to this country. It is stated that on the return of Governor Lane, tobacco was for the first time brought to England, and that Raleigh introduced the custom of smoking. As an article of commerce, but chiefly as affording a large revenue, since an impost was laid upon it in 1614, its introduction is of great importance. It appears that soon after the introduction of smoking, a proclamation was issued against it, and bitter complaints were made of this 'imitation of the manners of savage people.'" "It was feared," says Camden, "that by the practice of smoking tobacco, 'Anglorum corpora in

In the Harleian Miscellany, there is a curious paper on the Natural History of Tobacco, "I am confident," says the writer, "it is of the poison sort, for it intoxicates, inflames, vomits and purges, which operations are common to poisonous plants: besides every one knows that the oil of tobacco is one of the greatest poisons in nature; a few drops of it falling on the tongue of a cat, will immediately throw her into convulsions, under which she will die."

The writer then describes at length the various modes of using it in various countries. Of the Irish he says, "they do most commonly powder their tobacco, and snuff it up their nostrils; which some of our Englishmen do, who often chew and swallow it."

As for the qualities, nature, and use of tobacco, they may be very considerable in several cases and circumstances, though king James himself has both writ and disputed very greatly against it at Oxford, and Simon Pauli has published a very learned book against it. Some anatomists tell us most terrible stories of sooty brains, and black lungs which have been seen in the dissections of dead bodies, which when living had been accustomed to tobacco! However we will leave these statements to those who are skilled in anatomy, and as we have begun with the earliest accounts known in the old world of tobacco, as it was obtained from the new, we will follow up these notes with some more of its ancient annals. And this we will do from one of our middle-age volumes. A Canadian contributes the following:—

"It has often occurred to me in my dreaming days (for I am waking and dreaming alike occasionally) that some account of the history of tabacco now in such general and extensive use might not prove uninteresting to many readers. On some cold winter evening they might be cosily seated by their own fireside; or they might be strolling under their veranda on some fine summer morning, on either of such occasions enjoying the luxurious languor produced by the weed, and they might like to know something of its strange and eventful history, and the many curious vicissitudes, the exultations, rejoicings, and proscriptions, aye, even the extravagant eulogies and unqualified condemnations that the wonderful plant, the *Nicotiana Tabacus*, a nauseous, poisonous weed, of acrid taste and disagreeable odour, has during the lapse of a few centuries successively undergone; and yet has forced itself into every corner of the inhabited globe. And instead of being the insignificant occupier of some wild uninhabited forest, or obscure district, has succeeded in diffusing itself throughout every clime, and more than that, very far more indeed, has not failed to subject the people of every country to its fascinating enticements, to endure its baneful dominion."

barbarorum degenerasse videantur'" (Ann. Elizab. 1585). The Star Chamber ordered in 1614 the duty to be 6s. 10d. per pound. An act to lay an impost on the importation was passed in 1684. The quantity consumed in England in 1790 was nine millions and a half pounds, and in 1845 twenty-six millions three hundred thousand pounds, and the gross amount of the duty derived from it during that year, four millions two hundred thousand pounds sterling. Thus the introduction of it into England belongs to Sir Walter Raleigh.

Yes, let human nature acknowledge it as a fact even discreditable to itself, far amid the icy deserts of the frigid zone, far away as our adventurous navigators have found imprinted on the snow, the footsteps of the Greenlander, the Laplander, and the Esquimaux, there also have they found the name of this wonderful plant, known and valued by those hardy wanderers of the north, prized above the hard-earned trophies of the hunt, or the spoils of the sea.

But we may look further than the frozen regions of the north to find the marvellous weed appreciated and sought after. We find the Arab nursing it in the sands of the desert for tobacco: we find the sable monarch of a hundred wives, consigning in days not very remote thousands of his people annually to slavery, that he may enjoy his tobacco; we find the tawny native of wide Hindostan enjoying his cheroot, and where among the numerous tribes of swarthy warriors of the American continent, will it not be found, from the golden sands of California and San Francisco to the rocky shores of the St. Lawrence, Nova Scotia, and the United States: from the miserable digger of roots on the rugged and barren steeps of the rocky mountains to the Indian of the far slave lake, or his more manly and warlike brother who sweeps like the desert storm o'er the distant boundless prairie, where amidst all these is to be found him, whom the mighty magician called tobacco does not reckon as his slave, obedient to his relentless sway.

Shall we look to the civilized world as well as to a half savage condition of mankind, for exemptions from this abject condition of devotion to the weed? Alas we are met here with the same common assent. The soldier, tired with his long march, nay worse, say on a harassed retreat, when every article that might lighten his load, or add to his fatigue, when food, raiment, aye, even his arms in an enemy's country are thrown aside,—still in some snug corner of his bosom will be found that bosom-friend with which, even he hopes to lighten the hour of dreary watch, or make up for the scanty repast, his darling tobacco! Go to the sailor, let him have his tobacco, and what privations of food and rest are there that he will not endure if he have but his inseparable tobacco:—with this he will brave the fury of the elements, dare every hardship or danger of any kind; and if we turn to the higher walks of civilized society, at the shrine of fashion, in the palace as in the cottage, we find the fascinating influence of the weed no less exacting its tribute of devotion and attachment.

"A pipe," says Bulwer, "is a great soother! a pleasant comforter! Blue devils fly before its honest breath! it ripens the brain; it opens the house, and the man who smokes, thinks like a sage, and acts like a Samaritan!" What sweet enticing words are these to the young smoker! Has anyone yet told us after doing all this—of what it leaves behind? We shall see, for we have much to say of it yet. Pursuing the thread of our enquiries into the history of this remarkable plant, we come across some curious particulars that we have preserved in the progress of these pages. For instance on this subject our volume for 1851 supplies us with the following:

In 1559, the plant is said to have been first introduced into Spain

and Portugal by a Spaniard named Hernandez de Toledo and Jean Nicot, from whom the plant obviously derives its generic name, Nicot being ambassador at the Court of Lisbon from Francis II., either carrying or transmitting the same to Catherine de Medicis. Humboldt says, it was in general use among the natives about the Orinoco from time immemorial, who followed the practice of smoking it, and professed to cure many diseases with it. It is also considered to have been very early known and used by the people of some parts of the continent of Asia; but there can be no doubt that it first came to Europe from the west, and was thence carried into some parts of Asia. Of course a plant possessing the powerful properties primarily observed in tobacco, such as at first brightening and then clouding the imagination, became very soon an all commanding means of furthering the views of necromancers and designing men. We are told that among the American Indians when the Caciques were consulted on their important matters they took the leaves of the tobacco plant, and slowly burning them inhaled their smoke with the breath by the mouth. Of course they soon fell to the ground stupefied; and on their recovery, considered they had been in the world of spirits, receiving the required information, which they retailed accordingly. Such a purpose was no doubt one of the earliest applications of the weed by the untutored Indian, whose imposing priests loved thus not only to work on the credulity of his rude Indian companions, but also to maintain his superiority over the multitude.

In those early days superstition of all kinds stalked over the land. The light of learning had not dawned; much less had scientific truth been revealed; and the inventions of strange tales concerning it from the distant recesses of a huge continent like some stories about Columbus himself were commonly received with wonder and astonishment. Like the tale of Columbus and the egg, for instance, in itself a pure invention, everything was believed, and probable or improbable, passed current with the crowd. Tales of travellers accepted as from authorized persons at length came to be doubted as the shades of ignorance gradually began to disperse. But distance always assisted credulity, and many a mysterious story gathering mystery as it travelled of wonders worked being received with avidity throughout Europe (perhaps the more mysterious the better), it is by no means surprising that powers of a very mysterious kind were imparted to tobacco that led to its being acknowledged as one of the wonders of the world. In 1589, the Cardinal Santa Croce returning to Rome from his nunciature in Spain and Portugal took the plant with him. It can be by no means marvellous that the introduction of such a present, and by such a man, was hailed with enthusiasm, or that the effervescence of sentiments flowing in poetry with unlimited praise should be the effect of this, enriched as we might expect them to be with those outbursts of rhetoric which *its own* effects would suggest. It is even said that these poets compared the exploits of the cardinal with that of his progenitor, who is said to have brought home the wood of the *true cross*, that was employed nearly sixteen hundred years previously!—

one of those myths floating in the imagination of the devout for which his brethren are answerable. One of these poetic effusions alludes thus to the weed:

Herb of immortal fame,
Which hither first with Santa Croce came,
When he, his term of nunciate expired,
Back from the Court of Portugal retired:
Even as his predecessor great and good
Brought home the *cross!*

It is rather curious that as yet the consumption of tobacco had been almost confined to the manufacture of snuff, and that in England it was not till many years after this that the practice of smoking the leaf commenced. But its introduction into England cannot be dated with precision. To Sir Walter Raleigh as we have observed this is attributed by some, while others say that Sir Francis Drake first brought it into this country when he returned from Virginia in 1582, and being also adopted by Sir Walter Raleigh at the court, soon became general. At all events about this time tobacco in England was said to be worth its weight in silver! Thus John Aubrey, the eminent English antiquary says, "I have heard some of our old yeomen say, that when they went to Malmsbury or Chippenham market, they called out the biggest shilling that lay in the scale against the tobacco," and Camden in his "Elizabeth" writes thus:—"From the time of the return of Sir Francis Drake and his companions, it (tobacco) began to grow into very general use, and to bear a high price; a great many persons, some from luxury, others for their health, being wont to draw in the strong smelling smoke with insatiable greediness, through an earthenware tube, and then to puff it forth again through their nostrils, so that tobacco taverns are now as generally kept in all our towns, as wine houses or beer houses."

At the trials of the Earls of Essex and Southampton in 1600, the French ambassador, in his despatches, describes the peers by whom they were tried as smoking tobacco vigorously, even while deliberating on their verdict; and Sir Walter Raleigh is stated to be sitting at the window of the armoury in the tower smoking his pipe, as he witnessed the execution of the Earl of Essex. Whether true or not the fact of such stories as these being mentioned by the writers of the day, throws the light of probability over them, and is a timely evidence of the general practice of smoking, among the higher classes of society.

Another very curious episode in the history of tobacco is the notice taken of it in 1603, by our James the First. It is said that observing how general it was becoming among his subjects, many of whom he states expended as much as £500 a year on this luxury, his Majesty dipped his royal pen in ink and brought out a philippic entitled, "A Counterblast to Tobacco." Certainly £500 a year in those days was no small fortune to expend on the weed. And of course in this curious work, the king tells his "'loving subjects' that smoking is a custom loathesome to the eye, hatefull to the nose, harmefull to the braine, dangerous to the lungs, and the black stinking fumes thereof

are nearest resembling the horrible stygean smoke of the pit that is bottomlesse."

His Majesty, however, finding in 1604, that his work had not succeeded in extinguishing all the pipes of his loving subjects, resorted to a tax to enforce his doctrine, by imposing heavy dues with the view of abolishing its use at one stroke in his dominions; and a few years afterwards he even commanded that no planter in Virginia should cultivate more than a hundred pounds of tobacco!

So much for the attempts at its suppression in England. In Italy in 1624, Pope Urban the Eighth, actually published a decree of excommunication against everyone who took snuff in Church! And ten years later smoking was forbidden in Russia, under pain of the offender having his nose cut off! The police regulations of Berne in Switzerland, made in 1661, were divided according to the ten commandments, in which the prohibition of smoking stands next below the commandment against adultery; and in 1663 the Council of the Canton of Appenzal in that country, celebrated for some mineral springs, cited smokers to appear before them, whom they punished; and ordered all inn-keepers to inform against those persons whom they found smoking in their houses. Again, about 1690, Pope Innocent the Twelfth excommunicated all those who were found taking snuff or tobacco in the Church of St. Peter at Rome; and even so late as 1719 the senate of Strasburg prohibited its cultivation.

But all this was powerless. Notwithstanding all these decrees of kings and popes the weed grew in the estimation of mankind, and whatever might be its pernicious effects it still flourished, and still preserves its charmed existence. All these prohibitions, threats, and punishments, intended to banish it from civilized mankind, fell harmless on the weed, and tended rather like genial showers on parched ground to encourage its growth, to promote its cultivation; it became still more fertile and prolific, and now what do we see but all such decrees become the scorn and derision of society, and the weed holding its unlimited command alike over civilized or uncivilized society. Probably there is not another plant known in general use unless it be the potatoe, the privation of which would be more severely felt by the great bulk of mankind in general, than that of tobacco. No doubt many important articles of our food come from the vegetable kingdom, and it is quite true that tobacco may be classed as a luxury; but it is only one of the few, if not the only one, which is enjoyed alike by rich and poor,—the man of refinement and his fellow-man the uncivilized being of distant lands. The latter would tell you if he could that it soothes the long, dreary, winter solitude of the Laplander and the Esquimaux, the Indian of the torrid or the frigid zone, no less than it cheers the fireside of the humble cottager, while the former would descant on the calm serenity that it lends to the vacant hours of the refined voluptuary.

When we consult the statistics of tobacco, the unfailing array of figures from the national records, for instance, the annual statement of the amount collected for the customs' duties of excise on the article, we

have tolerably convincing proof of the remarkable vitality of the patronage under which it flourishes, proof to all the sentences of abolition, execration, and utter annihilation which have been so repeatedly levelled against it. About thirty years ago, it may be taken indeed as in 1836, the duty on tobacco imported into this kingdom for home consumption was about one half what it is at present. The following statement will form a fair means of comparison,

1836	£3,354,594	1865	£6,245,489
1853	£4,560,827	1866	£6,535,576
1854	£4,751,776	1867	£6,550,136
1855	£4,704,663		

So that in an interval of thirty-one years its use in this country may be said to have doubled, and the tax on it producing the enormous amount of six and half millions of money. In France the tax on it is said to produce a tenth part of the revenue of the country; here it might perhaps be taken at a twelfth part: but how long will it remain within such moderate limits, if in the course of the last three years it has increased a quarter of a million?

There are some curious records also concerning its use in the Royal Navy. An order issued by the old Navy Board, dated in 1697, on the 5th of November, directs that tobacco is not to be smoked in the yard (the dockyard must have been meant), nor in ships afloat, but *over a tub of water!* A curious order indeed, and one that would be found somewhat difficult to comply with now! No doubt the observance of this order became gradually infringed from the difficulty of compliance, but in 1734 to guard against fire on board ship an order appears to have been issued by the Admiralty in the terms following:—

"Such as smoke tobacco, are to take it in the forecastle and in no other place, taking all possible care to prevent accident from fire."

And a subsequent order of the Admiralty dated in August, 1841, says:—

"The Lords Commissioners of the Admiralty, referring to the fourth section of sixth chapter, Article five, of the Instructions for Her Majesty's Service at sea, in which it is directed that the captains of Her Majesty's ships are not to allow any person to smoke tobacco in any other part of the ship than the place appropriated for smoking, are pleased to direct, that the captains and commanding officers of Her Majesty's ships and vessels do give most positive orders that no smoking shall on any account be allowed in any part of the ship, except the galley."

When the fearful calamity of fire on board ship is considered, no restrictions, however severe, would appear to be too great against the possibility of its occurrence. Whatever may have been the effect of this order, it is within the recollections of old officers long before the foregoing order appeared, to have enjoyed a cigar anywhere rather than in the galley. The usual mess places assigned to the officers were in those days commonly invaded with cigars, and it is even beyond half a century ago that we can remember an unfortunate seaman gunner being found at work in the light room of the ship's powder magazine

with the still burning embers of a pipe in his pocket. The very idea of a man handling large cartridges of powder for cannon (about three pounds each), with the smouldering embers of a pipe in his pocket—thus risking the lives of above five hundred men at sea in her was appalling, and the punishment which he incurred thereby, was sufficient to prevent a recurrence of it. But the habitual use of the weed in this case had not only accustomed him to smoke anywhere on board, but had even deadened his sense of all danger or respect for orders of his captain, so far that he suddenly removed his pipe from his mouth to the pocket of his jacket a moment or two only before entering the ship's powder magazine for duty. But we shall see in the sequel that the fascinating powers of the weed over its admirers, have even done more than this in enslaving weak mortality and keeping its grasp on its victims, until placing them safe within the cold embrace of death itself!

There can be no doubt that many accidents of fire must be laid to the charge of an improper or immoderate use of the weed. We have heard of smoking being pursued with so much vehemence (we use this expression in full earnest), that it has actually consumed the vital energies, and the afflicted individual has been found dead in his bed. In reference to its use among seamen, it has been said by a naval author, that great were the objections on board ship to the order of the Admiralty above mentioned requiring all smoking to be done in the galley. This of necessity no doubt implies a closer contact with seamen, indeed a kind of companionship which is not only offensive to the feelings of gentlemen, but places the officer in an improper position, certainly injurious to that respect which must be maintained between officers and men on board ship whom they are in the course of duty to command. Thus the Admiralty might possibly in framing their order, have foreseen this objection, and intended it to discountenance the habit to its abandonment by the officer. For their lordships being naval officers themselves, no one could know better than they would, the kind of company they were thus placing him in. Indeed, we have known a late Admiral whose objections to smoking were so great that he would have no officer in his ship who had adopted the habit. But never has that habit so completely verified the adage, "Where there is a will, there is a way"—afloat or on shore it matters little, the weed still triumphs with or against all law.

A naval officer whose judgment and experience were no less respected than his amiable and kindly disposition, has left us his "professional recollections* on seamanship and discipline," in which we find him expressing himself as follows on this difficult subject of seamen using tobacco. Looking at it as a naval officer, and well aware of its hold on seamen, he says at once;—

"It would be difficult to find a subject that requires more gently handling, than that of smoking on board ships of war. Sailors as a

* Professional Recollections on Points of Seamanship, Discipline, etc. By Captain Francis Liardet, R.N., Portsea. Woodward, 1849. Longman, London.

body, are very fond of smoking; and when you take into consideration their isolated position, the few amusements they have, their great exposure to the weather,—blow high, blow low, a true sailor is always on the alert. How often have we seen in cold and boisterous weather, from the urgency of the ship's duty, the men so frequently called on deck, that their little stock of dry clothing soon runs out, and this will sometimes happen when there is no possible remedy, from a long continuance of blowing and rainy weather. Even under such circumstances you will see Jack as happy as a prince, if he can only have his pipe to solace himself with; he forgets then all about his wet clothes, and every other discomfort in the enjoyment of his pipe.

"I have remarked that those officers who understand human nature best, have always ordered extra times for smoking on such occasions. If boats' crews are away, or any part of the ship's company employed on duty during smoking hours, it is but justice that they should have the proper time for smoking when they return to the ship. The space allowed for smoking on board ships of the line, is generally too confined; a large frigate having nearly as much room for her men to smoke in as a ship of the line of the largest class. When men are so closely packed together while smoking, they have not the same motive to be careful, as they know as well as you do that you cannot attach the blame of the dirty deck to any particular person;—consequently without some extremely strong measure, you cannot prevent a recurrence of it. But when they have more room, they feel they are in a measure responsible for the appearance of the place where they are smoking; and this arises in some measure because detection is more certain.

"Many old sailors are so fond of tobacco that I have known them when this article could not be procured, use their *pockets* in which they had been accustomed to keep their tobacco, for both chewing and smoking. The custom in some ships, of stopping a man's tobacco for punishment, does not appear to have the desired effect, for if you stop a man's tobacco for punishment, you will only have a fresh claimant:—one who did not take up tobacco before, will then take it up and transfer it to the man whom you have taken it away from as a punishment: and as many as you punish in this manner, they will generally find people to come forward for them in the same way. I have known the question frequently put to them, 'you did not take up your tobacco before, why?'—'No, sir, but I have frequently borrowed it, and should now like to *pay my debts*, and have *my own* to chew and smoke with;' or some such answer as this."

Here indeed is a verification of the old adage above-mentioned, shewing there are more ways than one of evading a law! But in the course of our naval experience we have never known such a proceeding resorted to for punishment, as not allowing a man to draw his tobacco. Keeping his grog from him on account of his drunkenness, or watering it immoderately, and seeing him drink it in the presence of an officer, was common enough; but keeping him from enjoying his tobacco was perhaps more severe, although such draw-

backs of government allowance (which does not include tobacco) are afterwards repaid him.

So attractive an article everywhere has tobacco always been that even in the well peopled courts of the town, or the less frequented windows of the country village, it has its friends, and they too hold out its attractions in their own peculiar dialects. Here is one where three figures of highlanders were placed at the entrance door or in the window of a hovel in Cockaine city, on a paper disfigured by time. By these figures of men are represented the three different modes of using the weed, which were conveyed in the following announcement, conspicuously placed above them,

"We three is engaged in one cause,
I snuffs, I smokes, and I chaws;"

and that the passenger might not be at all at a loss for any explanation on the subject, they each displayed the attitude of the part taken—the quid being easily perceptible in the cheek of him who "chaws" in the shape of a huge swelling, the others in attitudes corresponding. Although we have not yet met an instance of the three modes of using the weed being found in one individual, in our walks through life we have yet met with a family (the pater familias being himself a British Admiral) in which three modes of consuming it were commonly employed. The female branches used the pulverized preparation, call it snuff, at the toilet; no doubt it is a good antiseptic applied to the teeth. Of course the minor male branches smoked like all other young gentlemen, and their father as a true blue jacket consoled himself with the quid! Full often have we witnessed the displacement of this last on occasions of his presence being suddenly required for reference in council matters, when the lump of leaf found its way from the cheek into the fireplace, and the handkerchief passed rapidly over the lips, that no appearance of the inevitable juice might disfigure them in the course of the debate at which he was expected, and to which he deliberately proceeded in compliance with the summons.

(To be continued.)

OCEAN VOLCANIC DISTURBANCES

South Pacific, Australia, and New Zealand, and the Sandwich Islands.

FROM some Sydney papers forwarded to us we have culled the following information concerning the effects produced on the ocean level on the shores of Australia and New Zealand. The day on which these commotions occurred was Saturday, August the 15th. They are for most part highly interesting, and although all from the same publication the *Sydney Morning Herald (S. M. H.)*, it is curious that the account of the perturbations at that place are the least intelligent. We content ourselves with preserving these curious records, leaving all discussion, as to the direction assumed by the volcanic action, to

those who may be in possession of more information, to which this may form a useful addition. But that this action came from the eastward seems conclusive by the extracts which we have added from Sandwich Island papers. And as the Thursday evening was noted at Honolulu as the time of the sea suddenly rising there; from this to Saturday morning at Australia would be perhaps thirty-six hours, shewing that the wave crossed the Pacific Ocean in a S.W. direction, and considering the distance travelled to be about 4320 miles would give it a rate of 120 miles an hour, which very nearly coincides with the calculations of Mr. Airy, the Astronomer Royal, alluded to in the extract from the *Daily News*.

I.—Newcastle.

One of the most extraordinary phenomenon that has ever taken place in our harbour occurred on Saturday, August 15th, and although the shipping in port was considerably disturbed and knocked about, I am happy to say no serious casualty happened to life or property.

The remarkable flow of the tide was observed at about 6.30 a.m., the vessels lying at the coal shoots feeling its effects to a greater extent—probably from the narrowness of the channel at this part. The tide was ebbing at this time, but I should state it had been remarked the flood tide was unusually high, in fact as high as the night tide, when it should, in the proper course of things, have only been what is termed half tide, at 8.30.

The tide suddenly fell between one and two feet, and as suddenly flowed again; the rush of water seaward was very great, at times running at least twelve knots. Of course the extraordinary action of the tide interfered greatly with the shipping, the vessels along the wharves and at the coal shoots parted their chains, ropes, and other fastenings. The *Alexander*, schooner, lying at the A. A. Co.'s shoots, parted all her warps, and had to anchor out in the channel. The *Planter*, also lying at the same shoots, was so shaken by the action of the tide that the captain expected every moment to see his masts go overboard. Several vessels got foul of one another at the shoots, and it was observed that the vessels (of which there are a large number) in the stream were turning round one after the other in a most extraordinary and unaccountable manner.

The most curious part of the affair was to witness large vessels of upwards of 1000 tons swinging round as majestically as possible, as if it were strong flood tide; the next vessel would follow suit; but before the third or fourth vessel could do the same, the first vessel would again right herself turning to the ebb tide; consequently the vessels well up the stream were seen at times in all manner of positions. Some of the captains deemed it prudent to let go another anchor, believing the extraordinary action was the effects of earthquake or volcanic wave.

The phenomenon continued throughout the day with more or less force, but the greatest rise and fall of tide took place at about 11.30, when the sudden fall was between four and five feet, and its effect

caused immense commotion. Not only were the sandbanks opposite the A. A. Co.'s shoots left completely uncovered, and as suddenly recovered, but many vessels along the wharves, and those near the ballast ground in the stream, took the ground. The steam tugs *Warhawk* and *Rapid*, which were proceeding up the Blind Channel, were suddenly brought to a standstill, their wheels showing well out of the water; they were not, however, detained long, the sudden influx of the tide soon set them afloat again. The *Fire King*, steamer, was also forced over to the bank opposite the shoots just as she got underway, the ships swinging round at this time very rapidly, and caused some alarm, the rush of the current being very great, a boat coming from Port Waratah in twenty minutes.

Some idea may be formed of the rush of water when it is said a boat, containing three men, was proceeding from the stern of a barque lying at the North Shore Ballast Wharf round to the bows, for the purpose of effecting some repairs, they had scarcely pulled three strokes when they were swept upwards of 100 yards seaward, the reflux of the tide bringing them as swiftly back again. Another remarkable event was the extraordinary low tide, the whole of the piles along the wharf were left quite exposed, sufficiently so as to enable any one to walk along at the foot of them; of course the sand bank opposite Bullock Island was left completely bare, and North Shore Point, on which stands a signal-post, and was never known but to be surrounded by water, was left high and dry. A party of police, who happened to be there at the time, and anxious to witness the unusual action of the tide ventured to walk round this post; they had barely time to return before the spot was completely covered with water. The ships and watermen's boats lying at the Market and steamers' Wharfs were thrown about in a very unpleasant manner, requiring constant attention. A fine whaleboat falling suddenly with the tide, got her bows under the wharf steps, the tide rising as suddenly caused her to go down bows first. One or two vessels out in the storm heeled over in a very dangerous manner, but fortunately none capsized. It was observed that the action of the tide caused the water to become very thick and foul. Mr. Keene, the Government Examiner of Coal-fields, who kindly gave me a few particulars, which I furnished you by wire on Saturday, estimates that at least five per cent. of mud was contained in the water. Mr. Keene watched the water-guage used by the Harbour department, and observed a rise and fall of two feet six inches in less than fifteen minutes, although it was about the time of low water.—*S. M. H.*, 18*th August*.

No. II.—Hobart Town, Tasmania, Moreton Bay, Australia.

It appears that the tidal disturbances experienced on our coast was also observed at Hobart Town and other places in Tasmania, and also in Moreton Bay. According to the *Tasmanian Times* of the 17th instant, it assumed the character of a tidal wave, as early on the morning of Saturday 15th, a tidal wave was seen approaching the shore at Newton, near the residence of Captain Bailey; there was a vast

body of water which spread over a large area of hitherto dry land. This phenomenon was repeated at intervals throughout the entire day, and was naturally a matter of much curiosity to the residents of the neighbourhood.

The *Hobart Town Mercury* of the 17th, also says:—"There was a very high tide in the river on the afternoon of Saturday, 15th; at Risdon the water overflowed the road, and, receding suddenly, left a number of fish high and dry, which were easily captured by those in the neighbourhood.

In Moreton Bay, about 400 miles north of Sydney, there was an erratic movement of the water. The *Brisbane Courier* of Tuesday says:—"On Saturday a very unusual phenomenon was observed in Moreton Bay by the residents of Sandgate. As it was popularly described, there were five 'tides' in the day. We were unable to obtain any very definite description of the rise and fall of the water, but from all we can gather it seems that the waves came in like the ordinary tide, but rose somewhat above the level of the highest springs. We learn that Mr. Slaughter's sons were cleaning out their boat on the beach at Humpy Bong, when suddenly, to their astonishment, they found the boat was afloat. They pulled out towards the bay, but before they had got many yards the boat grounded, and was again left high and dry. This occurred several hours before the time the boat could have been floated by the tide under ordinary circumstances.

The same phenomenon took place five times during the day, and created some alarm in the minds of the more timid. There are of course many conjectures as to the cause of these extraordinary waves, and the most prevalent notion is that the eclipse has something to do with them. The most feasible theory, however, seems to be that they are the result of volcanic action, for though far inferior in volume and velocity, they appear in some respects to have resembled the earthquake waves which did such damage at St. Thomas' about twelve months ago and more recently at the Sandwich Islands. There can be no doubt also, from these waves having swept over the bay simultaneously with those mentioned as having appeared in Port Jackson, that they resulted from the same cause in both places. Strange to say they did not affect the river at Brisbane. For the last two or three nights, however, the tides have been unusually high even for springs. On Sunday night the water was within six inches of flowing into the shed on Harris' wharf. This great rise is remarkable, as the highest tide of the springs, or as it is called the 'King tide,' does not usually take place until a day or two after the full or change of the moon, and the moon does not change until three o'clock this afternoon. Last night also the tide rose to an unusual height."—*S. M. H., 22nd August.*

III.—Sydney.

The erratic action of the waters in the harbour, as displayed in the ebb and flow during the last forty-eight hours, has not ceased, the ebb of yesterday combining very peculiar influences. At half ebb of the tide it suddenly fell six inches, remaining then stationary for half

an hour. It then again as quickly fell six inches, after which it appeared to exert its usual power. In Darling Harbour, during the forenoon, an unusual commotion was observed; the water without any apparent cause, suddenly curving and rushing in, with a certain degree of force, totally unprecedented in this harbour. The usual rise of the tide was not, however, more than might be expected, and, doubtless, the cause of this phenomenon may be fairly attributable to the conjoined influence of the planetary power exercised when the superior planets are in conjunction.—*S. M. H., 18th August.*

IV.—Wellington and Napier, New Zealand.

On Saturday, August 15th, a most unusual phenomenon took place in this harbour, and also in other parts of the colony, as we learn by telegraphic despatches which we have received; we refer to the irregular tide which took place that day, and which created not only astonishment, but in some cases dread that a great disaster was about to happen. On ordinary occasions, as is well known, the tide rises under the influence of the moon, with the greatest regularity, to a height which can be previously ascertained with the utmost exactness. There are two kind of waves; one, the ordinary ocean wave, occasioned by the wind, when the water does not move onward, and has only apparent lateral motion, in consequence of the rise and fall of the water—in the same way as a field of corn, when the wind passes over it; the other, the tidal wave, which ordinarily rises and falls twice a day with great regularity. That it does not always do so was shown on Saturday.

It is somewhat remarkable that the event was foretold; during the whole of the week a rumour was current in the town that there would be an unusual rise in the water on Saturday, attended with earthquakes; at every public-house bar the common expression was, "We're all going to be swamped on Saturday," of course, generally, both spoken and heard in a half-incredulous manner; but we have been unable to trace this rumour to its source. We can only say that the prognostication proved correct. On Saturday morning the water rose in an unusual manner, and consequently great excitement prevailed throughout the whole town.

The first indication of the wave was about half-past eight o'clock in the morning, and from that hour up to noon, the tide kept "bumping" against the brickwork beside the watermen's gridiron; sometimes rising above high water mark and then suddenly receding. Some people felt considerable alarm, for it was thought to be the precursor of something worse. Those who are given to ill-boding were disappointed. The time for high water was three o'clock in the afternoon, so that it would be dead low water at nine in the morning, and the phenomenon was therefore more easily observed. There was a crowd of persons on the wharf all day. People who are very weather-wise prophesied that something was "going to happen," and accordingly discovered, in the result, the vindication of their opinion.

The greatest observable difference in the tidal level was about eight feet. At Te Aro the water almost came up to the public street, and floated a quantity of timber which lay a distance of twenty yards from the high water level. But a still more remarkable effect was caused at the mouth of the Ngahauranga river, where a bar of gravel has been thrown up to the height of two or three feet. The reasons given for this extraordinary event are various; some say that it is the precursor of a great earthquake; others that it has been occasioned by the recent earthquakes at St. Thomas. At all events, two slight shocks of earthquake were felt here yesterday morning shortly after ten o'clock. It is supposed that the wave travelled westward, and some say that it had something to do with a solar eclipse which recently occurred in India. The following telegrams have been received from various ports:—

Bluff.—Tide higher last night than ever known. Between eight and nine this morning terrific rush of water. Tide very high. Large bodies of kelp washed in. Carried all the buoys up the harbour.—11 a.m., tide fell eighteen inches in twenty minutes.

Fort Chalmers.—Three buoys drifted. Large ships swung round twice in one tide.

Oamaru.—Extraordinary change in sea level. Since daylight tide rising and falling about fifteen feet perpendicularly at intervals of fifteen minutes.

Lyttelton, 10 a.m.—Heavy rush of water. It is also reported that the shipping has been much damaged. 10.30 a.m., water up to flood level.

White's Bay, 11.30.—Water up to Telegraph Office.

Nelson.—There has been a heavy rush of water over Boulder Bank, water in harbour much troubled.

Napier—Tide higher and lower in Iron Pot than ever known before.

Castle Point.—No shocks. The tide higher last night than for ten years.

The *Wellington Independent* also contains the following telegrams:—Nelson, Monday, 10.30 a.m. A rather sharp shock of earthquake occurred at 10 a.m. The tremor seemed to last about a quarter of a minute. It occurred at nearly the same hour as the tidal wave of Saturday. Dunedin, Saturday, 4 p.m. There has been a terrific agitation of the waters at the Bluff. The water rose and fell eight or nine times, and the buoys were washed far up the harbour. At Port Chalmers two ships at the anchorage had their heads completely turned round twice. The water rose eighteen inches in the hour. At Taiera the tidal wave entered the river and destroyed the punts. The wave was also felt at Oamaru. Monday, 7.30 p.m., at Otago Heads on Saturday a tidal wave rose five feet, and swept on to the shore. The vessels anchored there were swung round. Within two minutes the sea fell, and the tide ebbed seventeen inches. At Oamaru there was a tremendous surf. The highest wave rose eleven feet, dashed upon the shore, and came over the landing place. The wave receded rapidly, and the surf boat was stranded as the sea went back. At Taeri there

was a great rise and fall of the tide, the punt being washed away. A slight shock of earthquake has been felt to-day in Dunedin. It is reported that the shock was more severely felt at Blueskin.—*S. M. H., 25th August.*

V.—*To the Editor of the Herald.*

Sir,—The following extract from a letter, written by a scientific friend, may be interesting to your readers.

W. B. CLARKE.

St. Leonard's, 24th August.

"Wellington,* New Zealand,
18th August, 1868.

"My dear Mr. Clarke,—This is to give you notice to look out for earthquake phenomena in New South Wales.

"Hector, some six weeks ago, told us to look out here, as the earthquakes were travelling westwards.

"On Saturday last the waters of this harbour rose and fell, every ten or eighteen minutes, three or four feet, during the day.

"The same phenomenon was felt all along the East coast, from the Bluff as far as Napier, where the telegraph ends.

"At Lyttelton ships grounded, and one was lifted on to the pier and off again.

"The newspaper of to-day *(Wellington Independent)* says, 'Yesterday morning an earthquake shock was felt simultaneously from Lyttelton as far, at least, as Napier. Appearances quiet now.'

"J. C. ———"

S. M. H., 25th August.

VI.—The singular marine disturbance which is described as a volcanic wave, and some notice of which, as it appeared on other parts of the coast, was also observed in Kiama (says the *Independent*) on Saturday last. Persons at the wharf, observed between nine and ten a.m. a sudden rise and fall of the water; and the phenomenon was repeated between four and five p.m. The rise and fall on this occasion was between three and four feet. Slighter irregularities were perceptible as late as Monday.—*S. M. H., 22nd August.*

The following refer to the same phenomena at the Sandwich Islands:

Effect of the Recent Earthquakes upon the Harbour of Honolulu.—The water between the spar buoy and the bell buoy, on the outer anchorage ground, has shoaled from six to seven fathoms since the earthquakes of the first week in April. Pilot M'Intyre discovered that where he had 14 fathoms in the usual anchorage, now there are only 7½. The shoaled place is not very extensive, and accurate observations, which will be taken soon, will show how far the simple soundings already made will be confirmed. The depth of the water in the centre has not changed. Some think the reef on the

* About 1260 nautical miles E.S.E. of Sydney.

south-west side of the harbour has been elevated, as it appears more out of the water than before, but the tides, which have been lower than usual, may account for this apparent rise in the reef. Old marks on the coral prove that it has been growing slowly during many years past.—*Sydney Morning Herald, July 28th*, 1868.

THE VOLCANO.—Old Kilauea has been quite restless the past two weeks, and given signs of increasing activity. On the evening of July 23rd, two smart shocks were felt in various sections of the island, and also at sea. It occurred about ten o'clock in the evening. The schooner *Kate Lee* and the *Kona Packet* were at the time off the Kau coast, when the shock was distinctly felt, especially by the natives on board, who at once declared it an earthquake, as it felt as if the vessel had been stopped. On looking up toward the crater of Kilauea, Captain Crane saw what appeared like rockets or balls of fire, shooting out of the pit. He called up the passengers to witness the scene, which was a grand and brilliant one, and continued for some time. He estimates that these red-hot stones rose about 250 feet above the level of the crater rim as seen at sea. From a gentleman who visited the crater a day or two after this eruption, we learn that the stones were thrown out from a hole a short distance west of the south lake. As this lake is one thousand feet below the level of the upper rim or edge of the crater, these stones were thrown up to a height of not less than 1250 feet! We cannot learn that any one was in the crater at the time, though visitors are frequently there at night.

Mr. Delamar, who visited the crater two days after the above eruption, met a very narrow escape while gathering lava specimens. The old south lake, during the earthquake of April 2nd, subsided, making a pit about 450 feet deep and half a mile long, with steep perpendicular sides. He descended into this pit to secure specimens, and while down there, a portion of the precipice fell down near him, and a lava stream commenced flowing around him, which very nearly cut off his escape. A few minutes' delay in his retreat would have cost him his life. Captain Makee and a party of ladies were on the bank above watching him, but could have done nothing to help him, had he been enclosed. The old lake has enlarged its area, and is now divided into two larger ones, each boiling up and flowing over as of old. These lakes are of different elevations, often varying from twenty to one hundred feet above each other. Another traveller writes us that he saw a most beautiful sight on the 28th of July—a stream of lava flowing from one of these lakes into the other or rather two streams, about fifty feet wide, and *over a cataract some seventy-five feet in height.* This is a sight seldom seen in old Kilauea. From all these accounts, it would appear that the crater is very active and that interesting changes are now going on in it constantly. The appearance is continually changing, so that visitors on two different days would not find it the same. The Rev. Mr. Damon, who visited the crater last month, communicates to us an item which we were not before aware of. We give it in his own words:

"One fact about the volcano is quite noteworthy. When the great earthquake occurred on the 2nd of April, and the whole island of Hawaii was shaken from its centre to circumference, the shock must have been comparatively slight at the "volcano-house," for standing there, on the very brink of the crater, the house was not injured! Not a crack was to be seen in the brick chimney, nor an article of crockery was broken in the house. Everything remained *in statu quo*, as if indeed the earth was *terra firma*. This is a most singular phenomenon, and remains to be accounted for, when geologists make up their verdict respecting the late convulsion on this island."—*California Advertizer, August 8th.*

TIDAL PHENOMENA.—On Thursday evening, about nine o'clock, the natives living on "Fisherman's Point," south part of Honolulu, observed the tide rising higher than usual, and commenced shouting so as to alarm the neighbourhood. The sea however did not enter any of the houses, though it washed some of the door sills. About twelve o'clock midnight the natives were awaked by a peculiar noise resembling persons wailing, and on going out found the sea receding, the noise being caused by the water rushing over the reef. The return of the sea must have been gradual, as it excited no special attention. From that hour till morning the sea rose and fell several times, but we do not learn that anything special occurred. At seven o'clock, the sea again began to flow out rapidly, until fifteen minutes past, when it checked and rapidly returned. The extreme fall from the highest point, as measured by Mr. Emmes, was three feet ten inches. At twenty minutes past eight a.m. it again receded, and continued falling for fifteen minutes, when it turned and rose twenty-eight inches in eight minutes. Since that hour it continued rising and falling rapidly every twenty minutes, until about twenty-five minutes before three p.m. it reached the highest point, five feet and four inches above the lowest mark. While the sea was receding, it ran out the channel like a river, and over the stone wall on the north side of the harbour like a rapids. Standing near Emmes' ship yard, the water in the harbour was seen one foot lower on one side of the wall than on the other. The force of the submarine shakes that can cause so rapid a motion of the sea, must be powerful indeed.

These tidal changes are undoubtedly produced by earthquake waves at Hawaii, where some unusual commotion is evidently going on. When the great tidal wave occurred at Kau, at four p.m. on the 2nd April, it took two hours for it to reach our harbour, but then it rose and fell only twice and about twenty inches or two feet, but so suddenly as to attract general attention. Here we have a much greater disturbance, the difference in the rise and fall being more than double what it then was. When advices are received from Hawaii, it will be found that there has been a succession of earthquake waves, probably along the southern shores of the island, and in all probability accompanied with an eruption, either on land or in the sea. The heavy earthquakes felt on that island and the one also here last Friday night,

indicate an unusual disturbance of the volcano, and it will naturally be followed by an eruption.

Earthquakes have occurred very frequently of late in California, and indeed along the whole Pacific coast from Puget Sound to Chile, showing more than usual activity in the internal volcanic fires. It would seem as if there was an intimate connection between the fires under Hawaii and those in other parts of the Pacific.

—It will be interesting here to refer to the tidal phenomena, which occurred throughout the group in 1837. It commenced at six p.m., with the sea suddenly receding about eight feet below high water mark. The reefs were left bare, and many fishes killed. The sea soon returned and in twenty-eight minutes reached high water mark. It again receded six feet, and returned, and this rise and fall continued for several hours, at intervals varying from twenty-eight to twenty minutes. At Kahului the tidal wave was enormous and caused much destruction to property. At Hilo, the sea retired twenty fathoms and suddenly returned destroying houses, canoes, and fish ponds. The water in the harbour rose twenty feet above high water mark, and fell ten feet below that mark, making the maximum variation thirty feet. The destruction of lives and property at several of the villages along the Hilo shore was very great. No eruption of the volcano occurred, though the crater of Kilauea was unusally active. A tidal wave is said to have also occurred in May, 1819.—*California Advertizer, 15th Aug.*

Subsidence of Hawaii.—A letter from Rev. T. Coan published in the *Gazette*, confirms the reports before made that the south-eastern shore of Hawaii has subsided. Old residents of Hilo state that the same occurrence is observed at that port, but not to the extent stated below—the greatest subsidence noticed there being about eight inches. The following is Mr. Coan's letter:

"The south shore of Hawaii has subsided from Kapoho (east cape) in Puna, to Kalae (south cape) in Kau. The subsidence in some places is from three to four, and in others, from six to seven feet. It is proved by the trees, once on dry land, but now standing in the sea, and by rocky islets, once in five feet of water, but now submerged. These marks are so distinct that no difficulty exists in getting exact measurements of the subsidence. I found the lava disgorgement at Nukupili. It is very extensive, there being five patches on a longitudinal line of fissures. The lava oozed up from the fissures and spread over the adjoining pahoehoe. I explored thoroughly the land slide at Kewaia. It is not a *mud eruption*, but a great land slide, started by the terrific earthquake of April 2nd, and gaining its fearful momentum by gravitation. It is three miles long, about one mile broad at the head, and two and a half at the centre. I found the earthquake sea-wave of the same day, by reliable measurement at Punaluu and Honoapo, to have been twenty feet. I crossed the four lateral branches of the igneous eruption of Kahuku at their termination at Kaulike, and then followed the margin of the great stream to its source on the wooden hills. I judge it to be from nine to ten miles

long, by a mile and a half at its greatest breadth. I could not get the exact measurement, as the men engaged in running the line across failed on account of a large fissure in the way. There is a great deal of smoke in Kilauea, but little fire is visible. In Hilo, Puna, and Kau, from one to five earthquakes occur daily; not heavy, but enough to remind us of the volcanic forces, and keep alive conjecture as to what may happen. The oscillation of the sea at Hilo on the 14th, 15th and 16th instant, was remarkable. For three days the sea rose and fell once in ten minutes. The rise was not high, say from three to four feet, and no damage was done."

We would like to learn from any residents of the North-west coast of Hawaii whether any change has been observed in the level of the shore between Kailua and Waipio, and if so, where, what, and how much?—*California Advertizer, September 15th.*

MARINE EARTHQUAKES.—The sensations experienced on board ship when an earthquake shock occurs at sea, are peculiar and very similar in their nature—generally giving the idea of the ship having touched bottom, and being aground. This was the case on board the bark *Comet*, when an earthquake shock was felt about a year ago, 300 miles out from San Francisco. Captain Ludlow, in the *Hibernia*, described the sensation as the same as in the shock he felt off Hawaii, April 2nd.

Here is the latest incident of the kind, which occurred off the coast of Oregon in May last, which we find in a Portland paper:

EARTHQUAKE AT SEA.—Captain Corno, of the brig *Brewster*, reports that on the trip up from San Francisco, he experienced two shocks of an earthquake, each severe enough to startle all on board. He and his mate were engaged in the cabin when the first shock was felt, and they both ran out on deck with the impression that the vessel had struck and run over a reef. Upon looking down, however, no sign of shallow water, or of anything near the surface, could be discovered, and as the sea all around was agitated as if shaken by some convulsion, they concluded the shock was that of an earthquake. The second shock occurred in about a half a minute, and while they were still speculating about the first. The men tumbled up from below, frightened, and under the belief that the vessel had struck a rock. After the first alarm had subsided, to make sure that the vessel was all right, the pumps were tried, but no water was found in the wells. This occurred on the 18th, in latitude 44 degrees 7 minutes, and longitude 120 degrees 35 minutes West. The vessel was making at the time about eight knots. Her speed was not at all checked, a fact which would destroy the presumption that she had struck any sunken obstruction.

THE SUBSIDENCE OF HAWAII, FROM THE *Daily News*.—The intelligence which we published yesterday, respecting the progress of the subsidence of Hawaii, is worthy of careful consideration. It appears that since the great submarine eruption which took place

some months ago, the island has been gradually sinking, the depression of the southern and western shores having amounted to several feet; while that of the northern and eastern shore has not exceeded a few inches. It is important to attend to this peculiaity. Had the change of the sea level been uniform in all parts of the island, we might have been doubtful as to the seat and nature of the disturbance. The gradual elevation of a widely-extended portion of the bed of the Pacific Ocean would, in that case, have accounted as satisfactorily for the diminution in the height of Hawaii above the sea level as the sinking of the island itself. But the inequality in the motion of subsidence points at once to the real character of the disturbance, which doubtless only affects Hawaii and its immediate neighbourhood. We do not think, however, that the sinking of the island has been a gradual process. Far more probably it took place simultaneously with the outburst of submarine fire which caused so much mischief last April. The manner in which the Honolulu correspondent of the *New York Tribune* refers to the discovery of the change does not certainly convey the notion that any slow process of change has been detected. "It is believed," he writes, "that Hawaii is slowly sinking into the ocean. Ever since June last unusually high tides have prevailed along the southern and eastern shores, and it is now evident that the island has sunk," etc. It appears to us that the inhabitants do not fear that any further sinking will take place, unless—which seems unlikely—there should presently be other submarine explosions.

Very interesting also is the account of the waves which spread across to Hawaii from Peru, after the great earthquake of August 13—16 last. "The first of these waves was observed at Honolulu on the night of the 13th of August, and at almost the same moment it was noticed 200 miles to the south-east. They were more powerful at those parts of Hawaii which are nearest to the South American coast. They rolled in at the rate of three or four per hour for four days. They were not like the sweep of the furious breakers that lashed the shores during the April eruptions, but appeared to be the effects of some gigantic oscillation across the Pacific." There can be no doubt whatever that these waves were due to the great earthquake which recently desolated the coast of Peru and Ecuador. The waves must have been transmitted across the whole distance which separates Hawaii from Peru in the course of a few hours, or probably at the rate of about 1,000 miles per hour. This does not exactly agree with the statement that the wave was noticed almost at the same moment at two places 200 miles apart (and lying nearly in the direction of the waves' progress); but probably there is some mistake in this account. The difference of time must have been nearly a quarter of an hour.

It would be important if we could determine the exact rate at which sea-waves traverse the Pacific Ocean, since it has been shown that a relation exists between the depth of an ocean and the rate at which waves of given dimensions traverse it. We say of given dimensions, but it is not necessary that all the dimensions of a wave should be known in order that its ascertained velocity should suffice for the

determination of the depth of the ocean across which it has been propagated. All that is necessary is that the breadth of the wave should be known—that element being measured from summit to summit of successive rollers. The following Table is derived from one calculated by Mr. Airy, the Astronomer Royal. It presents the relation between the breadth of sea-waves, their velocity, and the depth of the sea they are traversing:

	Breadth of the wave in feet.				
	1,000	10,000	100,000	1,000,000	10,000,000
Depth of water in feet.	Corresponding velocity of wave per hour in miles.				
1	3.86	3.86	3.86	3.86	3.86
10	12.21	12.22	12.22	12.22	12.22
100	36.40	38.64	38.66	38.66	38.66
1,000	48.77	115.11	122.18	122.27	122.27
10,000	48.77	154.25	364.92	386.40	386.66
100,000	48.77	154.25	487.79	1151.11	1222.70

A little consideration of this table will show that the velocity alone affords an important indication of the depth of the ocean traversed by a wave; because in many instances the change due to the breadth of the wave is slight. Thus, when the depth of a sea is 1,000 feet, waves of 100,000, of 1,000,000, and of 10,000,000 feet in breadth all travel at the rate of a fraction over 122 miles per hour.

An earthquake which occurred in the year 1854 supplied an opportunity of applying Mr. Airy's formula. A shock of earthquake had been felt on board the Russian frigate *Diana* at 9.45 a.m. on the 23rd of December in that year. She lay at anchor in the harbour of Simoda, near Jeddo. At ten o'clock a large wave was seen rolling into the harbour, while the water on the beach was rapidly sinking. "As seen from the frigate," says the narrative, "the town appeared to be sinking." Fifteen minutes later another wave rolled in, and until 2.30 p.m. similar waves continued to come and go, the frigate being thrown on her beam-ends no less than five times. A few hours afterwards several distinctly marked waves, of extraordinary volume, arrived at San Francisco. No doubt can exist that those waves and those which destroyed Simoda had the same origin. In all probability the seat of disturbance lay very near the shores of Japan. Now, it was calculated by Captain Maury that the San Francisco wave had a breadth of 256 miles and a velocity of 438 miles per hour; and that the San Diego wave had a breadth of 221 miles and a velocity of 427 miles per hour. It would follow from these premises that, according to Airy's formulæ, the average depth of the North Pacific between Japan and California is, by the path of the San Francisco wave, 2,149 fathoms, by that of the San Diego wave 2,034 fathoms. Either result indicates an average depth of about two-and-a-half miles.

The rate at which the great waves of disturbance produced by the

earthquake of Peru traversed the portion of the Pacific Ocean which lies between South America and the island of Hawaii, would indicate that the ocean is here much deeper than it is further north. A similar result follows from the evidence we have respecting the rapid passage of the great wave produced by the submarine eruption of April 20th, from Hawaii to the shores of Mexico and Oregon. In that case a distance of 5,000 miles was traversed in little more than five hours. Probably the average depth of the part of the Pacific which lies between Polynesia and South America is little less than four or five miles.

The Baltic.

The Cronstadt journals mention an extraordinary subsidence of the waters of the Baltic in that locality. It began in the evening, the wind being S.W. and rather fresh. At ten at night the level of the sea was a foot lower than ordinary, and continued still to sink. The following morning at six it was two feet below its normal point, the wind having veered round to the N.E.; and at two in the afternoon the greatest depression was arrived at, namely, three feet two inches. The water then began to mount rapidly, and during the night exceeded its ordinary level by a foot. Nearly all the steamers plying between Cronstadt and St. Petersburg were aground, a circumstance almost unprecedented. As to the cause of this phenomenon nothing is known; but the supposition is that a strong N.E. wind drove the waters towards the Swedish, Danish, and Prussian coasts.

More Notes from Fiji.

In our number for June last will be found some remarks on the Fiji Islands showing the uncommon habit adopted there of referring the decision of all local disputes to foreigners. Thus Captain Stanley, of the United States' ship *Tuscarora*, decided several cases of dispute, much to the satisfaction of King Thakombau. The remarks to which we allude had more reference to these decisions than any thing else, but the following, which we find in a Sydney paper, alludes to the resources of the islands and the facility of establishing there trade and even manufacture. In so important a position as that occupied by these islands this will no doubt be appreciated and we shall soon hear of their being frequented, and in all probability occupied as a coaling station, for several of which there is abundance of room among the islands. The account says:—

The departure of the fine little barque the *John Wesley* enables me to bring my dates down to the 27th of July. She takes with her several passengers, most of whom intend returning to the islands. Since my last, many important events have transpired in Fiji. The king, who for years has been weighed down by the pressure of the

debt he had to pay the American Government, was relieved of his anxiety on the 23rd of July, when an agreement was signed whereby he gives 200,000 acres of the finest land in the islands, including two of its best harbours, and other important privileges, and the delegates representing the Melbourne and Fiji Banking and Trading Company taking upon themselves on the part of the shareholders to discharge this long outstanding claim. There is no doubt this arrangement will prove exceedingly profitable to the company, and the king will now render all the assistance in his power in protecting settlers living at a great distance from the seat of government. To the American Government also the present settlement is one that will relieve them of the harassing anxieties of an island war—which undoubtedly would have been the case had matters gone to their full tether. All here breathe more freely, and thus it is, independently of the benefits likely to accrue from the establishing of a powerful Banking and Trading Company in the islands, all anxiety about a threatened imbroglio with the United States is at an end.

The season for the gathering of the cotton crop is most propitious; all the plantation hands are at full work, and I am happy to say this is being done, in many instances, entirely by Fijians, who have the reputation generally of not physically straining themselves in this branch of industry. As white residents settle among them so the wants of the natives will increase, and I have no doubt, before many cotton seasons have passed, Fijian labour will be general throughout the group. When now brought into competition with any other imported islanders, the Viti man carries off the palm for endurance and labour accomplished.

The cotton maintains its superiority as to quality, and the best test of this is the account sales of net returns on the produce. During the late extraordinary reaction of a fall in the European markets Fiji cotton did not suffer in depreciation nearly as much as other sorts. There is an excellent variety of the Sea Island plant, or Gossypium Barbadense, grown on the island of Wakayia, by Dr. Brower, the Consul for the United States. Seed raised on his property has been distributed all over the group, and the best proof is the large yield, for there cannot be the scintilla of a doubt as to the cotton-growing capabilities of these islands. The saline humidity and equality of temperature of the climate, with the proximity of the plant to the sea, in addition to the most extraordinary fertility of the soil, are all advantages of which the cotton grower is well aware. For instance, from the Navua River to Naudi the climate is superior to that of Lima; rain keeps off for months at a time, the cotton consequently never gets stained, and preserves its beatiful snowy white appearance, commanding first-rate prices in the English sale room, and is the idol of the factory.

Writing of Naudi, a district on the north-west of the large island of Viti Levu, many rumours have come thence of the discovery of gold; this has gained ground within the past few days, so that it now assumes a tangible shape, on the authority of several reliable planters. I would not for a moment, however, seek to draw a population hither

on such ground; the gold of this country is most assuredly in the soil, and, if tickled with a hoe, will yield abundantly—but patient, and not spasmodic, labour is required. Merchants, hydrographers, botanists, and savans, have reaped rich harvests of knowledge in Polynesia, but the steady and intelligent search of the geologists is yet required. There are many important questions respecting various phenomena in these distant and secluded parts of the earth, which can only be determined and settled by the facts which an able and observant geologist could collect and analyse.

Copper, black lead, coal (recently found), petroleum, and cement are known to abound; the latter is pronounced to be the finest yet discovered. A gentleman of established scientific and practical abilities, who has had the control of large railway works and the construction of bridges, and who has examined the locality where the cement is found, pronounces its genuineness undoubted, and predicts a considerable demand will set in for the article. The happy result of this discovery will be of immense benefit to vessels returning to the colonies wanting freight, and supplying an article at considerable less cost than Portland. I have often wished I could send you some of the famous slab stones that are found here for your streets. My recollection of these *trottoirs* are far from having been agreeable in mid-winter; how easy, then, to mend your ways from Fiji. These Viti Levu slabs are equal to the famous Yorkshire flags, and require a very little dressing; they can be had in ten and twelve feet lengths, and in any quantity, obtained by native labour, and, in the primitive mode of using wood, levers are conveyed to their destination in canoes. The small island of Bau is protected from the encroaches of the sea by large slabs of the material described, where they have stood for years without fritting.

An arrangement has been entered into by the company and the planters on the Rewa River with respect to the cultivation of the sugar-cane, for this must ultimately become the staple of Fiji. I notice by your last file of *Mails* the Clarence settler is well pleased if he gets a yield of twenty-five tons of cane to the acre. Now, in an experiment lately made here, the quantity produced on an acre was forty-five tons. Far be it from me to depreciate the praiseworthy efforts being made in your colony to stimulate this industry; but then, does it not appear to you more feasible to take the machinery to a more suitable field, where the crop never fails, and where the result for man's labour is doubled? The quality of the cane differs a good deal in Fiji; in many places it reaches twenty-five feet in height; in others not more than fifteen feet. The saccharine matter in both is of surpassing richness. I have frequently seen cane eight to ten inches in circumference, and the joints ten to twelve inches apart. This I think undoubted proof of what its sugar-yielding properties are likely to be. Some extra information on this important head will probably be supplied you by Mr. Guilfoyle, who has lately made a trip (indeed, at present on board H.M.S. *Challenger*), making a collection of the flora from these beautiful islands, and the sugar-cane cannot possibly escape his observation. There are many acres of coffee planted; Dr. Brower, of Wakayia, and

Mr. Storck, of Viti Plantation, on the Rewa, being the principal growers. It thrives remarkably well, and the bean is quite equal to any that comes into your colonial markets. Were labour more abundant, a much greater breadth of land would be under cultivation. Many thousand acres of land have lately changed hands; the highest for town allotments at Levuka reached, in my opinion, absurd prices, as most probably the harbour of Suva, and its desirable land on the beach and inland, will become the entrépot of Fiji. But land, no matter where, has gone up considerably in price; and as the Company have come in and absorbed such a slice on the main island, speculators have to seek other fields in other islands for their operations.

The late arrival—the *Magellan Cloud*—brought down two gentlemen from Melbourne—for the purpose of operating on an article that up to now has been thrown away (the cotton seed). Several tons of expensive machinery have been introduced, and it is to be hoped the joint efforts of Messrs. Dr. Bohm and Rentsel, combined with the assistance of the Messrs. Hennings, will result in complete success. There is no doubt if the intelligent application of machinery is wanting to realise the desirable object of abundance of oil, that the opportunity for this branch of industry being perfected is the present.

The yield of cocoanut oil this year will be large, probably reaching 500 tuns; many buyers are already in the market for the article, and the natives are making oil readily. If the trees be spared from high winds in February and March there will scarcely be any limit to production. The event that has created great interest in Levuka the past month has been the opening of the literary institute. This pretty little building is placed on a knoll commanding both sea and land views, and is by far the pleasantest place on the island. On the opening night there were ninety-five persons present, and all appeared delighted with the intellectual repast provided. The missionaries, consul, and several distinguished notabilities took part, and on a subsequent evening Commodore Lambert, of the *Challenger* sent his band on shore; and the glee singers of H.M.S. *Brisk* contributed largely to the enjoyment of the night. The ladies did their parts bravely, and, were it not individuous to mention names, I could eulogise the individual efforts of Mesdames Cudlip, Moon, Logan, and Blackman. In making this short notice of these agreeable evenings (one that should be more particularised), I ought to mention the secretary will be glad to receive books and papers, and if addressed "Levuka, Walau, Fiji," will be highly prized.

The Tongese flag that has been flying for some years on some of the Fijian Islands to the eastward has been hauled down by order of King George of Tonga,—Maafu, the chief, having been appointed successor to the vuna of the Friendly Islands. The only flag, therefore, waving over Fiji is the one *pur et simple* of King Thakombau. These islands have lately had attention paid to them by an eminent conchologist—(Mr. Garrett)—who has spent many months of active and intelligent inquiry, and has succeeded in finding endless new varieties of sea and land shells; and he has discovered an enormous and rare beetle, which

is to astonish Beetle-dom; it measures three inches, and is considered a special treasure. A second has been found for the Count Castleneau, of Melbourne, a brother-worker in making collections of this nature. Indeed, it is said, he has the finest specimens in the world; and his patient perseverance has been rewarded by his being acknowledged the most approved judge in all matters connected with the insectiva.

A graceful act for services rendered was paid the Rev. J. F. Horsley a day or two since. This gentleman has been a missionary in the group for the last eight years, and during that time has exerted himself in the various localities where he has been stationed zealously and as a good missionary. For the past two years he has been stationed at Levuka, and, in addition to preaching to the natives, has conducted the white service, in a very able and beneficial manner to those who had the pleasure of sitting under him. The health of Mr. Horsley failing, it was imperative a voyage to a colder climate should be made, and as the *John Wesley* was just on the point of starting, it was arranged that they should, with their family, embark in her. To mark the innumerable acts of kindness the Levuka residents have received at the hands of Mr. Horsley, a purse of sovereigns, on his leaving, was presented him, and an address of a very complimentary nature was signed by nearly all the white inhabitants of Ovalau, coupled with an earnest wish for the restoration of Mr. Horsley's health and the speedy return of their beloved pastor. The place just vacated by Mr. Horsley has been filled by Mr. Nettleton, from Kataura.

H.M.S. *Challenger*, Commodore Lambert, left Ovalau on the 25th for the Rewa, when she would send an expedition up the river to destroy a native town, whose inhabitants had been "saucy." Of course, on the approach of the boats, the natives would disappear, so that no loss of life was anticipated. The *Challenger* would then probably leave for the New Hebrides Group, and thence to Sydney. Mr. Acting-Consul Thurston embarked in the *Challenger*, but would probably not go farther than the Rewa; he would then return to his country seat, fifteen miles from his consulate, on Ovalau.

A change has been made in the conduct of United States affairs in this place. Mr. Pritchette has been replaced by Dr. Brower, who, for several years acted in the capacity of Vice-Consul for Fiji.

The church was in high feather while the ships of war were here; one could scarcely circulate without running plump against a chaplain or reverend. Extra services were held, and the pretty little church was filled to overflowing. What changes in seven short years!

Many arrivals have taken place lately, bringing passengers. The *Albion* (s.) landed 47; *John Wesley* 17; *Banshee*, New Zealand, 27; *Magellan Cloud* 12; *Lapwing*, New Zealand, 17; *Susannah Booth* 12; *Ida* 7; *Mary Christina*, New Zealand, supposed 12; but I am left without time to ascertain the last named and sundry others.

Where Englishmen and Englishwomen are flocking—where British influence is felt—where all our sympathies and aspirations are purely Anglo-Saxon,—a time must come when something more than moral support will be wanting in preserving order and extending a helping

hand to the hundreds of settlers claiming to be British. This cannot be far distant; and although the cession of the islands has been once refused by our government, the increased importance of the group will, I doubt not, lead to a reconsideration of the whole question of annexation. Should such happily be the case, then would come the time to give Fiji another name; one at once proposes itself to my mind, and as you have recently had a visit from one of Her Majesty's sons, out of true affection and loyalty to her, and a compliment to the young Prince, I would suggest Alfred Land or Alfreda as a future name for old Fiji—whether the British flag waves over the group or no, this new name would readily be acquiesced in by the king and the chiefs of the islands.

There is some talk of establishing a weekly paper. Type and paper arrived in the *Lapwing*, from New Zealand, and a party to put both in operation. This cannot be long deferred. A fair circulation can be calculated upon, and one that will grow in importance daily.

The *John Wesley*, in addition to her shipment of cocoa-nut oil, is taking a quantity of beche-de-mer.

Levuka, Ovalau, Fiji, July 27th, 1868.

THE NAUTIC MILE: *In reference to Carrington's Tables.*

(From a Correspondent.)

ON examination of the Tables, noticed in your Number for October, compiled and extended by Mr. Carrington, of the Hydrographic Office, from the Ordnance Geodetical Tables; it will be observed that the compiler has introduced two additional columns beyond what appears in the original text: namely, the length in statute miles of one degree of latitude for every ten minutes of parallel, and corresponding lengths of one degree of longitude in minutes of latitude or nautic miles. The former of these values will doubtless prove useful to the land surveyor; but the latter I venture to think will be a source of embarrassment to the navigator and nautical surveyor;—and on these grounds, namely, that in tables of great precision (which these unquestionably are), the minute of latitude and nautic mile should not have been assumed as synonymous terms.

Although the minute of latitude and nautic mile are for convenience used as equivalents in special cases; as, for example, in scales to plans of harbours, or to charts and sailing directions of confined limits, yet for the general purposes of navigation the nautic mile is considered by all writers on navigation as a measure of *in*variable length (as necessarily it must be in practice); whereas a mile of latitude is a measure of known variable length, *i.e.*, 6045.9 feet at the equator, 6108 feet at the poles. From Mr. Carrington employing this measure of *variable* length he arrives at the result of there being 60·41 nautical

miles in a degree longitude at the Equator. There is evidently some confusion here.

A very clear definition of a nautical, or geographical mile, will be found in the "Glossary of Navigation," by the Rev. John Harbord, Naval Instructor, 1863; it is there given "as the *mean* length of a minute of latitude, and hence also sometimes called a '*minute.*'" Again, under the article Minute, "a nautical mile is sometimes so called as being the mean length of a minute of latitude. A minute of latitude is often conversely called 'a mile,' which, however, is not quite correct, as while the mile is of invariable length, the minute of latitude varies on different parts of the meridian."

The question now arises, what is the value of the nautic mile of *in*variable length. Harbord, under article Log-line, defines it as the "one-sixtieth of a degree of a great circle of the earth." Inman, as the "minute of a great circle." Riddle, as "the 21,600th of 360°;" thus all agree in assuming the degree of longitude at the Equator as representing sixty nautical or geographical miles. It is used in this sense, so far as I am aware, by the navigators of all nations; in the geodetical tables prepared for the use of the Topographical Engineers of the United States' army, 1853, Second edition (in connection with the great American Coast Survey), it is so used; for on the parallel of 20° (page 128), we find 56·404 nautic miles to a degree of longitude; but in Mr. Carrington's tables 56·722, or one third of a mile greater.

It is possible that some misapprehension as to the principles of globular sailing, and treating the earth as a spheroid, may have led to the confusion to which allusion has been made. The difference to the navigator of the two conditions, considering the earth either as a sphere or spheroid was not overlooked by our old writers on navigation. In the admirable "Elements of Navigation," by Robertson, and in the edition (sixth) 1796; revised by Wales (Cook's Astronomer in his early voyage), pages 203 to 214 are devoted to the differences arising in the "sailings" upon the two suppositions: in the discussion, an example is given with the calculations of the course and distance between the Lizard and Barbados, with these results:—on the sphere; the tangent of the course 50° 41′, and the distance in minutes of sphere, 3499:—on the spheroid, the tangent of the course 50° 51′ 50″, and the distance in the measures of the log, 3502.

The discussion is closed with this remark, "It appears from the preceding reductions that the course of a ship on the spheroid, is so near to what it would be on a sphere, that with a log-line adjusted to such a sphere, an artist may safely trust to the single rules of globular sailing in his days' works, even though his account of course and distance were much more certain than it is possible for them to be."

It may be here added, that Robertson and Wales considered the "sea mile" as the sixtieth part of the degree of a great circle; and it is to be hoped that Mr. Carrington's scale may not displace this assumption.

[Our notice of the tables alluded to by our Correspondent will be

found in page 576 of the October Number, the anomalies to which he has alluded being not unperceived by ourselves. Still we let them pass, late in the month, being quite satisfied that they would soon be held up to their author for explanation.—ED.]

POSITION OF RASA ISLAND, S.E. OF THE LOOCHOO GROUP.

To the Editor of the Nautical Magazine.

SIR,—In the number for October, 1867, there is a useful communication from Captain J. B. Steele, of the ship *Sebastian Cabot*, and if you will allow me I will say a few words with reference to a paragraph contained therein, which is—"On the 13th June, 1867, we passed over the position assigned to Rasa island, viz. :—Lat. 24° 27′ N., long. 130° 40′ E., but saw nothing of it. A sufficient proof that it is not situated in the above position."

Now, Mr. Editor, this Rasa island is a sore point with me, an irritating affair you would say, because *I know* that *another* position was forwarded to the Hydrographic Office, and likewise placed on chart 2412, in 1858, and why it is not there now, is a mystery to me. Nevertheless, I would have kept my personal feelings to myself had I not seen this remark of Captain Steele's in the *Nautical*, which has somewhat put my "back up," and I must have my say, presuming that you will kindly publish it. Unfortunately the position alluded to was not sent to you at that time, or, doubtless, it would be found recorded in the pages of the *Nautical*, and Captain Steele and others possibly would accord it more value than that given by the Spanish frigate *Magellan* in 1815, and the French frigate *La Cannonière* in 1807. However, better late than never, therefore I will explain.

In 1856, I was chief officer of the ship *Lancashire Witch*, Captain A. S. Molison, belonging to D. Dunbar and Sons, of London, and sailed from Spithead on 17th of April of that year, with detachments of the 12th, 11th, and 65th Regiments for Hobart Town, Sydney, and Wellington respectively. From New Zealand we proceeded to Shanghai, passing between the Fiji and New Hebrides islands, Sinian and Rota (Ladrones), and on the 12th September, 1856, we came upon Rasa Island. Our commander had purposed passing well to the eastward of it, but lo! and behold, there it was on our port bow on the morning of the above date. At nine a.m., when sights were taken for time, the highest point bore N. 64° W. (mag.) (wooden ship with no deviation locally of any practical amount) ten and half miles, and the wind being light, ship only sailed six miles on a N.N.W. ½ W. course till noon, and then the same point bore S. 83° W. seven miles, our meridian latitude was 24° 27′ N., and the chronometers gave the point selected in longitude 131° 5′ 30″ E., being a difference of twenty-five and a half miles east of the position given in the Directory.

On the following day, after having made sixty-five miles difference of latitude and 28′ 45″ difference of longitude *by chronometer* we saw the Borodinas from the tops, highest point bearing N.E. ½ E., and after sailing five miles N. by W., the same point bore N.E. by E. ¾ E. This projection would place Rasa Island about on the same meridian. From thence we passed between Yok-Sima and Oho-Sima (on chart 2412), struck soundings of thirty-four to twenty-five fathoms, fine dark sand, on the 17th, 150 miles E.S.E. of the mouth of the Yangtze (probably the first recorded depth in that locality), and arrived at Woosung on the 19th September, therefore measuring the meridian distance from Rasa in *seven* days. Now, although I was not master of the ship, nor had I charge of the chronometers, and therefore disclaim all responsibility for their performance, nevertheless, I may say I was intimately connected with the navigation of the ship, and had some knowledge of the chronometers since the 17th April, and therefore, Mr. Editor, it does seem, and is an impertinence for me to tell you, or any other navigator, that they (chronometers) must have been worthless indeed, and ought to have been pitched overboard if they could not measure a meridian distance in *seven* days, so as to assign a position to Rasa infinitely of more value than that given by the *La Cannonière* in 1807, and the *Magellan* in 1815, for the simple reason that those ships, in all probability, had no good secondary meridian from which to measure at those dates. At all events, I will leave the value of the respective positions to the judgment of my professional brethren. I believe Captain Molison reported fully to Sir Frederic Nicolson, then in command of the *Pique* at Woosung, and of course I assume it would be forwarded to the Hydrographic Office.

However, when I returned to London, I passed my examination as master, and while doing so, before Mr. Bell of the Local Marine Board, the subject of the *Lancashire Witch's* soundings, and Rasa Island came under his notice, and he desired me to furnish him with any particulars, which I might have. I did so, and he transmitted them on to the Hydrographic Office, including my chart, No. 2412, upon which was our track. In a few days my chart was returned to me, and also a new copy on which was engraved, "Rasa Island by ship *Lancashire Witch*," and the soundings also similarly expressed. This was very satisfactory and gratifying, and I would here take the opportunity of publicly acknowledging that, for two or three reports which I have made directly from myself, I have received very flattering and courteous recognition of my services.

I again lost sight of the subject for some years, until 1863, when I stumbled across it in the "China Pilot, edition 1861," and there I read at page 310, "Rasa Island, seen by the Spanish frigate *Magellan* in 1815, and the French frigate *La Cannonière* in 1807, is in about latitude 24° 27′ N., longitude 130° 40′ E., about four or five miles N.W. and S.E. low, covered with bushes and surrounded with rocks."

Now, Mr. Editor, here was a grievance for your humble servant, and I asked myself the question, How came Captain King to quietly ignore and shelve the fact that the English ship *Lancashire Witch* had seen

it and given a longitude which had been acknowledged by the Hydrographic Office, and which I contend is of far higher value than those quoted above, when he edited a book of such importance to navigators? It is needless to say, I never found out *the* answer, nor any answer, and, therefore, I think Captain King ought to have mentioned our report, leaving its value to his readers, for, although I would not maintain for a moment that it was a correct longitude, nor within a few miles, yet I do say it is better than the others, and would be useful to any one passing in that neighbourhood. At all events, it would have been worth the editor's consideration to record the fact in the Directory, unless it can be shown there was some gross error or mistake in the position forwarded. Had it been inserted, I think Captain Steele would not have passed near our position without seeing Rasa Island.

I remain, Sir, your obedient servant,

W. SYMINGTON,

Master, ship Melbourne.

[There can be no doubt that from some oversight, nothing appears of Captain Symington's correction of the longitude of Rasa in the China Pilot, even in the last edition of 1864. Nor do we find it recognized in the twelve-sheet chart of the Pacific Ocean. And yet in the latest edition of the chart mentioned by our correspondent, No. 2412 of the Admiralty Catalogue, "Islands between Formosa and Japan," there it stands, nearly in the meridian of Borodino, in its proper place. Why it is allowed to remain in *duplicate* on that same chart, and in a position on an ancient authority shewn to be erroneous, remains for consideration; and why the two charts keep it thus in two different positions, we need not attempt to explain. We regret, however, that Captain Symington's correct position was not transmitted to this journal, where it would have been of easy and immediate access, so that its very questionable condition might have been at once rectified. —ED. *N.M.*]

ANOTHER GLANCE IN A MIRROR AT OURSELVES AND OUR NAUTICAL INSTITUTIONS.

(Continued from page 602.)

THE Sailors' Home is grafted so to speak on a society the members of which pay at least one pound a year as subscription. Those who contribute ten pounds in one payment are life members. Such indeed is one of the sources of its revenue, but it is by no means the principal. The receipts which vary from seven to nine thousand pounds annually, come principally from the sailors who pay for their board and lodging. But for a debt of three hundred pounds sterling contracted for the purchase of ground the institution might be considered self-supporting,

and it is important it should be so. But the hand of benevolence has contributed to establish an institution which but for its assistance would never have been done: yet now that the Sailors' Home is established, it should be protected from a system of support at all times humiliating. The sailor is naturally brave and independent; a part of his vices such as improvidence and prodigality tend even to inspire him with confidence in himself and the resources of his profession. What does he know about expense or care about the morrow. Has he not the sea to which he can go when his pocket is empty? Grog and biscuit are always to be had on that element in which sports the leviathan. With such a feeling many a sailor scorns to be sheltered under a roof where he has a vague idea that he is under an obligation to some one. The bread which is gilt by a grain of charity to him is bitter. The good reputation of sailors' homes would be still more increased among sailors themselves when they can resort to them as to an hotel, sit down at a table and pay their own expenses, and lay themselves down on a bed where their dignity is not compromised by a feeling that they are partaking of charity. These institutions already have a tendency to increase, twenty-four homes similar to that of Dock Street have been opened in different parts of the United Kingdom.

And yet it is right to observe their success has not always followed as might have been expected from them. These institutions have to contend with more than one kind of obstacle. The crimp and his myrmidons, who have so much to gain in perpetuating the ruin of the sailor, naturally endeavours to keep him from an establishment for his benefit. "Don't go to the Sailors' Home," he will say to him on landing: "they have got cholera there, small-pox is making terrible ravages there, the yellow fever was introduced there last week by the crew of a ship from New Orleans." Jack is brave but artless; as he does not deceive himself he does not perceive that others are lying to him, and such accounts of it are not of a nature to attract him to the home in Dock Street. Besides the influence of the crimps he finds more than one reason why he should not go to the Sailors' Home. What men most love who find themselves on shore after being subjected to a rude discipline at sea for months or perhaps years is the exercise of their own free will. The land seems to them the place of liberty which many of them it is true mistake for licence. But Jack is neither a saint nor a monk. He has not left his ship to go into a convent. The Sailors' Home I know imposes nothing on his moral restraint, but it has been still necessary for the sake of order to submit to regulations. He is not to swear or make use of gross expressions, the sale of spirituous liquors is not allowed in the home, and he is not allowed to smoke his pipe except in the great hall which serves to walk in. But what the sailor who has been so long under restraint so much dislikes most when he is on shore is even the shadow of control of any kind. Has he not come on shore in fact to be his own master, and to spend his money as he pleases? "The cormorant does not like the cage," I was once told, by an old English sailor to whom I said he had better go to the Sailors' Home, rather than go to an obscure house in

Wapping, where he was badly fed and badly lodged. Many others are of the same mind. Of what use is it to declaim against dark dens, when the land shark attracts the sailor, or against old clothes with which the slop-dealer deceives the sailor. Such dens after all have their charms, he can there do as he pleases. Those old clothes are dear to him, they even cover his independence.

Let me not here take the part of the sailors' enemies against his home, against his real interest. Such institutions have rendered enormous service, and will render. Everything in them is right and good—if I expressed my real opinion I would say it was too good. Since the directors of these institutions have made them the schools of morality they have held out the reward of conversion. The most virtuous among sailors, those who have already followed the principles of order and sobriety, find these institutions without doubt a refuge against fraud and the great temptations of large towns—but the rest of mariners dwell more or less outside of the benefits of the Sailors' Home. Between the crimps who are the scourge of seamen on shore, and institutions founded above all on a religious scheme, are they not placed by establishments where the generality of them find themselves sheltered from a system of extortion without in any way sacrificing his enjoyments. If men with generous intentions have done much of late years to improve the condition of the English sailor, does it not remain for the government to do something in another way to put down by severe laws the fraudulent conduct of the lodging-house keepers, and to encourage thus the establishment of honest furnished lodgings which will not thrive by impoverishing him. A nation whose greatness depends above everything on the sea naturally has the highest interest in protecting by efficient measures those men who devote their lives to it in defence of their country. The veritable protection of Great Britain lies neither in the wooden ships which to-day are set aside, nor in those of iron, the advantage of which over the others is yet doubtful. That protection consists in securing the devotion of the sailor to her service. Is it not then the first duty of the State to place the honour and well-being of the sailor beyond the reach of those grasping individuals who are more constant in making him their prey than the vampires of the sea are in devouring his carcase.

By the side of the Sailors' Home stands the Sailors' Asylum which is supported by the same philanthropic society. This latter institution is one entirely of charity; giving lodging, board, and clothes to the poor sailor of all nations and to provide him with work. Since 1827, 43,904 sailors entirely destitute have found a temporary shelter in this place of refuge. Some consuls in acknowledgment of the benefit received by the seamen of their countries who were reduced by misfortune to indigence have sent sums of money to the institution. It is observed that France has as yet done nothing although many a French sailor has been relieved by it. Other institutions of England also supported by voluntary contributions receive the orphan children of seamen, a solicitude for the class, shewing their country appreciates their services. We will follow these persons at sea who

owe so much to Great Britain, for a naval education is at all times to our taste.

To English sailors every vessel is female and every one is regarded as the fiancé of that genius of the wave, with her wooden or iron sides with which he follows his errant fortune. The feminine gender applied against all general rules of language to inanimate objects which float on the waters is certainly not a little surprising, but what is still more so is that the ship of war in spite of her name, "man-of-war," is subject to the same grammatical custom, it is always "she." Up to the present day ships of the line belonging to Great Britain were built in the royal dockyards, but which in these days were thought so little of in comparison with iron ships. I was present in 1863 at the launch of the last ship of war which the Admiralty had built at Woolwich. The giant reposed on his cradle, for what other name can be given to this house of such a considerable size, covered in by a roof with glass windows in it. About three hundred persons had been invited to this nautical ceremony, in fact they were everywhere and all about this warhouse that was soon to bound into the element for which she was intended.

What a number of things are to be seen in a line of battle-ship; all so well known to sailors, not to omit the diminishing amount of daylight from the upper deck to the hold. Without and within everything wore its holiday dress. A brass band even served to enliven the company. At a given signal the huge vessel started from her long rest, and gliding along her narrow platform rushed into the Thames; a bottle of wine in due form having been dashed against her bows from some fair hand. This of course was the signal for enthusiastic cheering which continued until she was fairly afloat, when even to the agitated surface of the river all was quiet again. One can easily connect this display of feeling with the thoughts of the dangers and perils which that huge vessel will hereafter undergo; the battles in which she may be employed as well as the rocks and gales of wind she may encounter and escape. But many a large ship has not even been exposed to these. There she was with neither mast nor crew, and like some others may never have either. However, having seen the process of a launch, and interesting enough it is, we left her for the shore.

Much the same ceremony takes place since the introduction of iron only that the new monsters belong to another system; those like the *Warrior* and the *Minotaur* not being constructed in the Royal dockyards. No doubt the government has found it far preferable to employ the large iron building establishments, such as the Thames Iron Company, which also constructs for the mercantile marine, especially the Pacific and Oriental Company, the largest establishment of this kind in the whole world. Still the ship of iron or of wood whichever it be must have officers and crew to navigate her. Which is the class of population among which the British Navy is recruited.

Before this question is answered the great difference between the Royal Navy and the army must be considered. In the army com-

missions are purchased, but not so in the Royal Navy, where advancement is gained from attainments, merit, and ancestry. The line which is nearly impassable that separates on shore the subordinate officers from the higher is entirely effaced in the ranks of the Navy. Some of the British Admirals have come from cabin boys. There are plenty of marine cadets who are examined at the Naval College at Portsmouth, but all enjoying certain privileges, none form an exclusive corps. Great names no doubt occur here and there on what is called the Navy list, but it is easy to perceive that it is more especially the middle class which sends candidates to the navigation schools, and the lower class which supplies the voluntary enrolment, and if this be the case with the Royal Navy, how much more it must be so with the mercantile navy. Cannot we also see the motives which lead the English to go to sea.

Many of them go to sea it is easy to see because they have no other resource, no other line to follow. Such however is not always the case, and certainly there are maritime vocations. Among the youth whose home is on the shore of Great Britain, there are those on whom appearances exercise a kind of fascination. The sails of passing ships in the horizon, the mirage attractions of foreign countries left on the imagination by conversing with sailors, the beauties of nature to be found at sea,—all these things make up the dreams of the youth who would go to sea. "The ocean wins them as the pond attracts young ducks," say the people on the coast. How often does a whole family struggle in vain against this desire, this natural inclination? I knew on the coast of Norfolk a young lad about twelve years old who was thus dreamed away by the sea. Twice he ran away from his father's house where he had made an engagement with the captain of a merchant ship: but in the third the father was too late,—the vessel had sailed and he was gone.

Others again are carried away by reading accounts of voyages sometimes all romance: this rich branch of English literature extends even to villages, and as fiction obtains more admirers than fact in the youthful brain, it is not difficult to find even in the interior of the country the youthful imagination tormented by the nautic fever. And yet it must be added these young enthusiasts do not always make the best sailors. A sea life is after all monotonous and prosaic. No doubt the ship's movements are an incessant amusement to the young sailor among the sublime scenes sometimes before him! But has he time to enjoy them? Severe work and the austerity of the ocean commands his labour. The ocean may suggest to him liberty! does he find it in his ship. What does he find there but hard work? The blessing of sleep, that solitary enjoyment of the slave does not belong to the cabin boy, interrupted as it is every hour of the day and night, besides by the voice of the captain. Obliged to leave his bed for the deck whenever the exigencies of the sea require it, the sailor is incessantly at the mercy of the elements and his captain.

Add to all this, his regular watch in bad weather, the hard service, the imperious orders, the severe floggings, and one can comprehend

how it is that the beautiful poetry of the sea vanishes with the reality. The romance of it vanishes gradually, and the novice says in his heart to the reckless waves, "alas, how you have deceived me,"—nevertheless, there he is, and there he must remain. From self respect, perhaps necessity, he must embrace a profession which has filled his brain. Nothing would undeceive him, and nothing would make him confess his disappointment to his friends or induce him to say he had made a bad choice. But disappointment overtakes him in after-life as a cloud covers the sky. What then remains for such disappointment but the loss of natural energy through life? Again, there are plenty of youngsters who are sent to sea by their friends to correct certain bad propensities; and these mauvaise sujets, no doubt, make good sailors. They have no delusions to get clear of; they handle the ropes in earnest, and turn to account with good will the labours of a life to which they are condemned.

This last case of circumstances gives rise, no doubt, to a generous spirit. Having learnt that a training ship destined for the reception of the young riff-raff of the streets, and to reform them for the sea had been for some time stationed at Greenhithe, I made my way to this village on the bank of the Thames. Having reached the pier, I found a frigate lying moored a short distance in the river. Hiring a boat, another vessel which served as a church was passed on the way to the school ship, which former vessel was the resort of sailors who desired to go through their religious duties without quitting their element. Outside the ship were some fine youths dressed in blue trousers, with a blue woollen frock and a cap, on which appeared in red letters the word *Chichester*, the name of the ship, who were occupied with their duties. And were the same lost children of London streets, known by the name of Arabs from their vagabond habits? I was received on board by Mr. A. H. Alston, an intelligent young officer of the Merchant Service, who offered with much civility to show me the arrangements for converting her into a naval school. The *Chichester* was not launched yesterday; this took place twenty-six years ago: but like many other vessels built by order of the Admiralty, she has never been at sea. She was rotting under the shelter of some dockyard, when the government had the good sense to lend her (that is the term for giving) to the managers of the moral movement now going forward on the banks of the Thames. When she was turned over to the Society which manages these things, she was but the vessel herself. The dockyard, it is true, furnished the means of masting and rigging, but on the condition that their expense (about £2,000) would eventually be defrayed by the Society by subscription. The masts and rigging of the vessel form the means of educating these lads for their duties at sea. The main deck has been adapted for their wants, and is divided into a school room, a mess room, and a cuisine where the younsters carry on their work with an air of importance. The principle, in fact, is that all work should be done with young hands. The lower deck is occupied at night by hammocks, and is the dormitory.

All these arrangements, although as yet incomplete, have already

incurred an expense of £3,000, and a third of that sum is not yet covered by subscriptions. Notwithstanding this, the directors have entire confidence. Money is never wanted in England for a useful work. The idea is good in practice and that is the talisman of success.

Let us look at the circumstances under which this institution has been established. Some little time ago, Mr. James Greenwood called the attention of the citizens of London to the casual ward of the workhouses, to which in the night all those resorted who living on chance in London, had neither bed nor any shelter where they might lay their heads. Instead of trusting to vague report, Mr. Greenwood determined himself to penetrate into these resorts of misery. He disguised himself, concealed his name, and in borrowed rags of clothes had the courage to pass a night in the midst of the company in one of these wards. The narrative of what he saw and experienced produced an extraordinary sensation in the country. But thanks to him, it was ascertained that children in these places were thrown together with adults of the most immoral characters. The facts he related moved several charitable souls, and a search was set a foot for all the little vagabonds who had been accustomed to sleep in the casual wards of the London workhouses as well as in any similar resorts of darkness.

On the 14th of July, 1866, they were all invited to a supper at the boys' refuge in Queen Street, nearly two hundred assembled in obedience to the summons, and the meeting assumed so touching a character that, in the presence of all these children without a home of any kind, many ladies could not repress their tears. The chairman addressed several questions to these little Bohemians with the view of discovering the origin of their miserable condition, and the remedy he proposed to apply to them. "Suppose that a ship," he said, "were to be placed in the Thames as a school-ship, how many of you would go on board of her?" Every one present said he would go!

Scarcely was the *Chichester* placed at the disposal of the Committee, than a ceremony took place at Blackwall to inaugurate this new appropriation of the ship. Soon it was that she found her way to Greenhithe, and fifty young Arabs were placed on board, too happy to take their abode on the river. Twenty-five more were at hand, and before the end of the year it was expected that two hundred of these abandoned little beings would form her party. The Committee propose to distribute their resources in three classes. One hundred children would be in the refuge, two hundred would be on board the training ship for instruction and being familiarized with the habits of a sea life, and lastly, a country establishment with one hundred acres of ground should serve as a model farm to bring up another hundred of these youths in the works of agriculture.

Some among the new party on board the *Chichester* have passed two or three years in the streets of London without having had a roof over their heads, not even the shelter of the casual ward. Preferring their liberty to this sad resort of public charity, they would sleep among the rubbish of houses pulling down every day in London, under half demolished walls, or under the arches of a bridge!

In the first capital of England how many thousands of children are there who have left their paternal roof, often no paternal roof to them, while others have been abandoned by their parents, or have been left to the tender mercies of the world from the death of a mother! The street receives them, adopts them, and rears them. London to them is a desert where, lost among the moving crowd, they always find their road. The greater part of them delight in this kind of hard life. They like the stars of the night and have no other fear but the eye of the policeman, their young spirit, fertile in resources, glories in its independence and its difficulties; but if not stopped in time, on their fatal course, they inevitably verge towards the prison and the treadmill. Could they have avoided this? if so, where lies the fault? The moralists with a remorse of conscience for his neglect of society, has at length directed his attention towards the innumerable means of relieving these little Arabs. What are they fit for he asks. The answer is, they will make good sailors. Adventurous, accustomed to privations, and from a tender age to depend on no one but themselves, they are composed of the stuff from which the English sailor can be made. With roaming blood in their veins, are they not well adapted to wander over the great desert of the sea?

Extracts from the Address to the Section of Geography and Ethnology,

At the late Meeting of the British Association for the Advancement of Science, at Norwich, August 20th, 1868.

The following extract from an address to the Geographical Section of the late Meeting at Norwich of the British Association for the advancement of Science, will prove interesting to the readers of the *Nautical*; as expressing the views and opinions on the several subjects mentioned therein, which are entertained by the matured experience of the Hydrographer to the Admiralty, Captain G. H. Richards, R.N., F.R.S.

In tracing the history and progress of geographical discovery, we find that maritime exploration always has been, and indeed necessarily always must be its precursor. When the coasts of a country have been thoroughly explored and defined on the map by the aid of astronomy and other branches of science, then, according to various circumstances—to the nature of the climate, the character and extent of the population, and other physical conditions—will the geographical features of the interior be developed with greater or less rapidity; all history and experience confirms this, and there are not wanting familiar instances within our own observation.

Wherever, then, it has been possible for navigation to penetrate, there the shores of the world are sufficiently known for all the purposes of geography proper, although in the interests of navigation

itself, and of the commerce and intercourse of nations, we have ever been, and probably ever shall be, as long as the world lasts, adding to and refining on this knowledge. The science then, indeed assumes other phases, such as Hydrography, and the Meteorology and Physical Geography of the ocean, the latter becoming every day of more interest and importance in a practical point of view, and therefore demanding in a proportionate degree the aid of science in its development.

In the Physical Geography of the ocean must be included a knowledge of its depths, the nature of its bed, its temperature, its currents at the surface and beneath the surface, and other information necessary to meet the requirements of the present age; for instance, without this knowledge it would not have been possible successfully to lay the submarine cables which now connect Great Britain with America, and which it is reasonable to suppose, so soon as the requirements of commerce shall justify the outlay of the capital, will be followed by similar ones, until the whole globe is encircled. France and America are about to be united by such a tie; a cable will probably be shortly laid through the centre of the Mediterranean Sea, connecting Gibraltar, Malta, and Alexandria, thence through the Red Sea, and across the Indian Ocean to Bombay: a portion of this will certainly be completed within a few weeks. The connection of India with China on the one hand, and with Australia and New Zealand on the other, will probably not be long delayed. These great undertakings require not only a knowledge, but a very accurate knowledge of all the conditions I have mentioned, the obtaining of which demand an amount of skill, and patience and perseverance on the part of both engineers and seamen, which those not fully conversant with the subject can little conceive. Our efforts, then, of late years have been directed to this end, and by the aid of science, and the modern mechanical appliances it has supplied, instead of the vague and imperfect knowledge which we possessed up to a comparatively late period, we are now in the possession of far more accurate data: we know the depth and nature of the bed of the North Atlantic between Europe and America by three different routes, and that it does not in any part much exceed two geographical miles, or about 13,000 feet.

The Mediterranean Sea has been accurately measured, and its greatest depth has been found scarcely less than that of the Atlantic. But a few weeks since the Indian Ocean, between the Red Sea and Bombay, and over other portions, has been sounded with remarkable accuracy, the maximum depth obtained being something over two Geographical miles. Between China and Australia a great portion of the distance has been accurately examined, and the remainder is at present in progress; while but a few days since accounts have been received of the bottom of the sea having been reached in the South Atlantic, between the Cape of Good Hope and the Equator, the greatest depth obtained being 18,000 feet, or nearly three geographical miles, and no doubt or uncertainty exists in any of these operations, for in all cases the bottom has been brought up in considerable

quantities. I cannot myself but regard these results as of infinite importance, and second to none of the geographical discoveries of past years; many of them, indeed are the results of the last year.

In connection with this subject, I would desire to call the attention of those interested in it, to a series of Physical Charts of the Atlantic Ocean, lying on the table; they are among the latest of the labours of the Hydrographical Department of the Admiralty, and will in a few weeks be available to the public. The present and only copy has been pushed forward for presentation to the Section, and at no distant time they will be followed, I trust, by a similar series for the Pacific and Indian Oceans. * * * * * *

Even with the geography of the vast groups of islands strewed over the Pacific and Indian Oceans, we are for the most part tolerably acquainted, thanks to maritime discovery, in many cases aided by the labours and researches of the church missions, which have taken no inconsiderable share in the work. But there is another side to the picture, and it must be confessed that it is a darker one. If we turn to Africa, even to Australia, to New Guinea, to Borneo—to that sealed book of the north lying almost at our very threshold—the mind can barely contemplate the vast problems that geography has yet to solve, and we almost sicken at the reflection how little—how comparatively little—has resulted from all the great efforts and noble sacrifices which have been made by individuals in our own time and in the times before us.

Let us turn to Australia: here a great English nation may be said to have sprung up within the present generation, and yet scarcely more than a corner of it can be considered as fairly occupied; with its sea margin alone, and with not even all of that, are we thoroughly acquainted, and notwithstanding the dauntless energy and courage of the numerous explorers, too many of whom have given up their lives in the cause, it is no exaggeration to say that by far the greater part of the interior of this sea-girt Continent is as little known as it was when Cook first visited its shores a hundred years ago.

In the interest, then, of any future explorations, the question seems to arise—To what causes are we to attribute the comparatively small measure of success which has hitherto been attained? It may be that there are undertakings beyond the scope of individual enterprise, or indeed of any enterprise not under the direct aid and auspices of a government; doubtless great physical difficulties existed yet they were not in most instances underrated: means and resources may have been inadequate, organization and combination may have been wanting, but be this as it may, it is certain that as yet no effort has been made commensurate with the difficulties to be overcome and the importance of the results to be gained. A perfect knowledge of the geography of a country must doubtless inevitably follow, and not precede occupation and civilization; but these conditions exist now to a certain extent in Australia, and it does seem that the time has come when a combined effort should be made to clear up what must be almost considered a reproach to geography. Those who have read or studied the history

of geographical discovery, cannot fail to have remarked how seldom any great results have been attained until after repeated efforts and many failures, and how often, when hard-earned experience has made success seem almost certain, the prize has been relinquished when almost within our grasp. This can scarcely remain the case long as regards Australia: an organised exploration of the interior indeed has been proposed, and is still under consideration; it has received the warm approval and countenance of the Geographical Society, before which a paper has been read on the subject by its author, Dr. Newmayer, a resident of Australia, and intimately connected with most of its scientific institutions; but on a question of such dimensions no society can do more than give its sympathy: it is a problem for the united governments of Australia to solve, and it is to be hoped that when undertaken it will be with such adequate means, organization, and co-operation, both afloat and on shore, as will render failure impossible.

There is yet another *terra incognita* almost within view of the northern coast of Australia, in the great island of New Guinea, whose shores even have scarcely been correctly traced on the map. It has been visited, however, by navigators of different countries, and there is little doubt but that, like the smaller islands in its neighbourhood occupied by the Dutch, it is rich in all the choicest products of the earth.

It is to be feared however, that the time is distant when this interesting country will be opened up to commerce and civilization; its great extent, and the hostility of the natives, among other causes, place it far beyond the reach of any individual efforts, and none of the maritime nations seem yet prepared or disposed to set their mark upon it.

I am unwilling to leave these southern regions without a few passing words on that latest acquisition, and perhaps most flourishing dependency of the British Empire, New Zealand: as an instance of the rapidity and success of exploration and colonization almost coincident with each other, it is probably the most remarkable in the annals of the world's history; undoubtedly it possessed in a high degree almost all the conditions favourable to such a result—an extent of country equal to Great Britain, of a form and distribution the most favourable for development by nautical exploration—with a climate admirably suited to Europeans, it seemed indeed to invite civilization.

Scarcely thirty years ago almost its sole white occupants were a few English Missionaries, who indeed, have generally been the pioneers of civilization in these distant regions; ten years later when colonization was first seriously undertaken on a great scale, the sagacious nobleman then at the head of the navy, Lord Auckland, foresaw that the shortest and most certain road to success was a complete nautical survey of its coasts, which, under his auspices, was at once commenced, and completed within seven years. During this interval, colonization progressed with rapid strides; and at the present time, despite the drawback of years of native wars, New Zealand, or, as it has well

been called, the Great Britain of the south, is peopled throughout its length and breadth by Englishmen, in the possession of the luxuries, wealth, and prosperity of an old and long settled country.

There is one incident in the history of New Zealand which is not generally known or remembered, and it is an instance of what momentous results to a whole nation may sometimes arise from apparently trifling or accidental causes. The incident is this: that but for the fortuitous presence of a little brig of war there, I think in the year 1839 to 1840, commanded by the late Captain Owen Stanley, a name that will be familiar to many in this old city, that flourishing country, or at any rate the largest and the fairest portion of it would now have been under the flag of another nation, and there would have been the singular coincidence of a second English Channel at the Antipodes, with our opposite neighbours looking at us across what is now known as Cook's Straits.

I now approach a subject of geographical discovery which has always been received with favour in this country, viz., the exploration of the North Polar regions, but in order to a clear understanding of the present state of our geographical knowledge there, and the prospect of its future, I must revert briefly to the past.

So early as the middle of the sixteenth century the efforts of Englishmen were directed to the discovery of a passage from the Atlantic to the Pacific by the north, or what was called the North-West passage; not only would such a passage infinitely shorten the distance to the Pacific and China, but it was the fashion in those days for each maritime nation to have its own route, and Spain and Portugal, with the good offices of the Pope, laid claim to the monopoly of the present highways of Cape Horn and the Cape of Good Hope. To possess such a short and exclusive one, therefore, close to our own doors, was a great inducement to persevere; many then were the efforts made, with no approach to success beyond additions to geographical knowledge, and after the middle of the eighteenth century, Arctic enterprise appears to have slept for nearly a hundred years. The end of the long war, however, left the navy without much occupation, and the subject was again revived, chiefly owing to the able advocacy of the late Sir John Barrow, who was its consistent supporter to the end of his life. The voyages of Parry, Franklin, and others, in 1819 and subsequent years, to the west and to the north, are familiar to all; Parry, however, never succeeded in reaching further westward than Melville island, in about the meridian of 115 degrees, and no ship has ever since penetrated to the westward of his. The subsequent expedition of Franklin in the *Erebus* and *Terror*, which left England in 1845, and was never again heard of, until M'Clintock discovered the records of its sad fate in 1857, was the last attempt to discover a North-West passage, though more in pursuit of scientific investigations, than in the belief that any passage existed which could be turned to practical advantage. But it was this interval of twelve years which was fruitful in Arctic discovery. Expedition after expedition was despatched by the Government, from the east and from

the west, in search of the missing navigators, with the full approval of the nation, and with the frequent co-operation of the citizens of another nation, the United States, who shared with us some important geographical discoveries; and it was during these years that the North-West passage may be really said to have been made by a ship's crew, which entered the Arctic Ocean by Behring's Straits, and returned nearly four years afterwards, by the Atlantic: but no ship has ever yet passed through this frozen ocean; though from the day that Parry first stood on Melville island, in 1819, and looked out upon it to the westward, no reasonable doubt could be entertained but that there was water or ice communication between the two oceans.

The manner of the accomplishment of this passage was thus: In 1853, M'Clure reached the Bay of Mercy in Banksland, where his abandoned ship, the *Investigator*, now lies; at the same time lay the *Resolute* at Melville island, scarcely more than 150 miles distant; the crew of the former walked over the ice to the latter and were conveyed to England in a third ship.

Whether another attempt will ever be made to force this 150 miles of ice or water is immaterial; it is certain that it can never be turned to any practical account; but that vessels will yet pass from one ocean to the other by this route many are sanguine enough to believe. The North-West passage, however, has been settled, and the great question with geographers now, and especially among those who shared in the labours and the honours of the search for Franklin and his companions, is the exploration of the Polar Sea, and the discovery of the North Pole itself.

English naval men naturally look upon this as their inheritance, and are very jealous of it, though it may be in some respects a barren one. Geographers of all nations, while they earnestly desire its accomplishment, have, with one consent, generously accorded the honour of its fulfilment to us. The Council of this Association and the Royal Geographical Society of London have exerted all their influence to promote the undertaking; the great geographical authority of this country, Sir Roderick Murchison, has been a consistent and untiring supporter of Arctic enterprise, and geographers of all countries are deeply indebted to him, and have acknowledged their indebtedness; but I must take leave here respectfully to dissent from Sir Roderick when he infers, as I think he does, in his Annual Address, that the disagreement among Arctic men themselves as to the proper route to be followed has been the principal cause of no action being taken. I cannot think this; doctors frequently differ as to the mode of effecting a cure, but, nevertheless, it is very often effected, and by different modes. Geographers may differ as to the road by which they would prefer to reach the Pole; but there is no Arctic officer of experience who does not believe that he could reach it, whether by Smith Sound or Spitzbergen.

Let it be remembered that we can never yet be said to have brought steam to bear upon Arctic discovery; that all our costly searching expeditions of late years have been searching for Franklin, and that all

the discoveries they have made have been incidental to that search; any one of those expeditions would certainly have discovered the North Pole, if such had been the object, but even to look towards the Pole in these days was little short of treason. It must be admitted there are enthusiasts as well as geographers strong on this question: the eminent German Geographer, Dr. Petermann, is so much an enthusiast in the cause, that at his own cost he has just sent a little vessel of eighty tons, without steam power, to reach the Pole between Greenland and Spitzbergen: I wish I could hope that he would reap the success he deserves. But the error which, as I think, the advocates of Polar exploration have fallen into is, that they look upon the Admiralty as responsible for the discovery of the North Pole. If there was an enemy there, or a known friend in distress, it would undoubtedly be their duty to look after either, but under present circumstances, it is no more within their province, as it appears to me, than to place a squadron of steel gunboats on the lakes of Africa to suppress slavery. I can imagine that nothing would be more congenial to the individual members of that branch of the Government than to adopt both these glorious expedients, which would reflect so much lustre on the country and on themselves, but it is the country that must do these things, and if the country wishes them done, and will provide the means, they will be done speedily and effectually.

The North Pole is just as much a public question—if I may make the comparison—as the Irish Church, and if canvassed, possibly might considerably affect the approaching elections. Perhaps one of the most powerful arguments in favour of Arctic exploration or Antarctic exploration at the present time is the necessity of educating officers and seamen in preparation for the great astronomical problem, which must be solved in a few years' time—as near to the South Pole as we can get—for it is difficult to believe that this country will not take an important part in the solution of that great problem: and Arctic seamen will not last for ever, nor can they be made in a year. I will only add further on this question of the North Pole, that it appears to me to be one of those cases of success all but attained, and within our grasp, and I trust that the country which has borne the heat and burthen of the day will not be robbed of the crowning honours.

There is another subject connected with geography in which I believe a large section of the public of this country feel a special interest, and which it would be improper therefore to pass unnoticed here. I allude to the research which has been, and is still being carried on in Palestine, under the direction of officers of the Royal Engineers, and to the projected exploration of a portion of the Peninsula of Sinai, which it is hoped will be shortly commenced.

The latter project originated with the late Captain Butler, of the 55th Regiment, who made considerable explorations there, but on the breaking out of the late war was recalled to his regiment and subsequently fell at Inkerman. It was afterwards warmly taken up by his brother, the Rev. Pierce Butler, supported by many friends, and but for the sudden and lamented death of the latter gentleman a few months

since, it would doubtless have been now in progress: there is every reason to hope, however, that it is only postponed: a few hundred pounds in addition to the funds in hand, will suffice to defray the cost of the undertaking, and a cause of so much interest is not likely to fail for want of the public support. On the table will be found printed papers setting forth the objects of the expedition, and the results which it is hoped will be attained. I will only add that the name of Captain Palmer, of the Royal Engineers, who has been selected to conduct the Survey, is a sure guarantee that it will be well and completely performed.

I have little now to add. I said I would dwell briefly on the practical results which might be expected to follow the geographical research I have briefly sketched out, but it appears to me they almost tell their own tale: there is one great result, however, I will advert to, and which in the interests of this country and two of her great dependencies I hope will not be long delayed—at least the commencement of it—I mean overland communication between the dominion of Canada and British Columbia on the shores of the Pacific: it is impossible, I believe, to overrate the importance of this work to all concerned: it will practically unite these two great colonies in British America, and open up a vast and fertile country, where our surplus population may live under their own flag instead of seeking a home under another: it must be remembered that we are living side by side on that great continent with a people second to none in their enterprise and perseverance; that already they have carried a railway from the Atlantic almost to the Pacific, and that they are completing it under difficulties as great as any we should have to encounter; but a few days since I received a letter from our Consul at San Francisco, in which he says "the Pacific railway is rapidly progressing, and in 1870 passengers will be carried from New York to San Francisco in five days." If British America is to progress under the flag of this country, and if we are to maintain our commercial position in the Pacific and in China, we must not be slow to follow this example; geographers have done enough to prove that the undertaking is feasible; Canada and British Columbia are alive to the importance of it, and as to the latter its very existence, I believe, depends upon it.

The National Life-boat Institution and the *Devon*.

On Friday night, the 23rd of October, a Government lighter named the *Devon* was making her way round the Land's End to a western port. She was a strong built steamer and good sea-boat, and could well enough have weathered the hard gale which was then blowing; but those in charge of her mistook their position, and she got so close in shore that they ran her, in the dark, stem on, upon "the Brissons," a double islet of rock which stands above the sea some sixty or

seventy feet high, about a mile from the headland known as Cape Cornwall.

As soon as the boats were lowered they were swept away by the seas, and the vessel herself was broken to pieces in a very short space of time, drowning seventeen poor creatures, including the commander, and a woman with two children, who were on board as passengers. Of the few who tried to buffet through the fierce breakers towards the rock, all but one man were either dashed to death upon it, were drowned in the attempt, or were killed by the floating wreckage of the lighter. This one man, George Davis by name, stouter or more fortunate than his shipmates, after being beaten and bruised on the rocks by the waves, and more than once washed back from his last hope of life, was flung half-senseless and bleeding among the sharp rocks of the Brissons; but he managed to crawl beyond the reach of the breakers and remained—the only survivor of the *Devon's* crew. Let those who lie quiet and safe a bed in these howling, chilly nights, picture to themselves the sufferings of such a fellow-creature. Perched upon the rock, with the black night closed and impenetrable around him, nothing to be seen but the gleam of the surf on the savage waves; nothing to be known of his further chances of rescue till the morniug should break; his comrades swallowed up in the raging sea below, rioting and leaping about as if it were mad that he had escaped, and meant to have him after all.

In the calmest weather these Brissons are ugly, lonely huge blocks of stone, accessible only to sea-fowl; and the ordinary roll of the Atlantic lashes their black, rugged sides, to disperse over them in spray and white cascades. Think of him as he sat there, in this dark, stormy night, cold and hungry, and in sore pain from the lacerations made by the sharp limpet shells, and these pointed crags; while the sea, that had wrecked the doomed vessel and murdered all hands but himself, roared and waved about and swept away to leeward into the gloom, all his hope, if any hope there was. Life is sweet, but there must have been moments in that dreadful night, when the castaway envied his dead shipmates. In these unhappy moments he little thought of that Life-boat Society in the Adelphi with its able management and admirable system of boats ready for work on all our coasts. If morning should break, and not show him the coast near at hand, he must die of thirst and cold—a ten times harder death than the quickly-ended struggle in the great waves. If the coast proved nigh, would he be seen, or left to perish in sight of safety? Nay, if he were detected from the shore, was there any way of getting him from such a hell of angry water?

As George Davis sat shivering and pondering on possibilities and impossibilities the morning broke, and—yes!—there was the mainland—a mile off, with all the well-known line of cliff and its bay trending towards the Land's End. A fine seaboard it is, with its dark promontories, and leek green meadows crowning them; and lovely do those yellow coves appear, as the sea runs up them, and makes creamy lines along their edges, or rolls into the caves through their

high cliff arches. But how bitter-sweet it must have seemed to Davis when, do what he could with waving his jacket and moving about, nothing, along the well-known coast, gave any signs of his being seen! How hard it must have been to him to make out the pleasant country houses, the fishing villages, and the safe firm hills and valleys, while he beginning to die of ache and exposure—a poor invisible speck on the lonely isolated rock, while between himself and security lay that hungry mile of wild water which made it well nigh a hopeless thing for any crew to "bear a hand," as sailors express themselves, even if he should happen to be perceived by them.

But if not exactly a "sweet little cherub," something as serviceable and more practical was on the watch "for the life of poor Jack." The old coast-guard man on the headland had made out much of the wreck of the *Devon* early in the morning. The broken timbers, indeed, were drifting into the surf in the sight of the coast people; but nobody except the old boy caught sight of that "spot of something" moving on the face of the rock. Nor could he get anyone else to see it, though one after the other had a long look through his glass; still he stuck to the fact so uncommonly hard, that happily by-and-by messengers were sent to Sennen to bid them try and put the life-boat out to the Brissons. They don't want to be "certain" about such things at Sennen: the chance of saving life is enough to rouse those gallant Cornish shore-birds; and very soon the life-boat was launched with ten stout fisher-hands in her, and Matthew Nicholas for coxswain.

The men pulled through four miles of frightful sea, and came near the rock. Nothing alive was to be seen! There was a corpse or two about the foot of it, and wreckage; but the old coast-guardsman had given them the hard job for nought! They shouted, however, with tough lungs and kind hearts, every time the wind and sea lulled a little; but nothing showed, and the boat was under way again for the shore, when the poor castaway, shifting himself to get a dry place to die in, came round a crag into sight. Now, indeed, they "sang out" with a will; but he had not seen them, and could hear nothing for the bellowing noise of the breakers. Who knows what silent impulse had made him show himself just before it was too late; for now they mean to have him before nightfall, if seamanship can do it. By-and-by some deep-chested fellow flung his friendly "Ahoy!" far and loud enough; and George Davis heard, and saw the brave boat. Says a hand on board of her, "He threw his arms up in the most wild manner, and looked as if he had got new life in him." So he had; and he moved as if about to come off the rock at once, but they signaled him to wait, for there was no getting near it on account of that boiling surging water! To windward the waves would have swept the life-boat on the rock; to leeward there were off-lying rocks, and no holding ground.

Luckily the rocket apparatus was in the boat, and with it Mr. Morrison, the coastguard officer, then performed a veritable feat on behalf of poor Davis. The crew brought their boat to anchor about one hundred and eighty yards to leeward of the Brissons; then it was

found that the stand of the rocket-tube was too high. They had to lash the apparatus fore and aft, and this was done with all a sailor's quick shiftiness. Yet even then the apparatus wasn't sufficiently amphibious—the trigger wouldn't go till the line was rove through a ring-bolt. All of this reads easy enough; but let it be observed, that practising with the rocket-line on firm ground is one thing, and fitting it to fly from a small boat, leaping and plunging in the sea, and driving every now and then bows deep in the salt water, is quite another thing. Still, the little cherub who levelled the old coast-guardsman's glass so seasonably, and whispered to George Davis at the right moment to get up and be saved, had his eye along the rocket tube, and when it was fired it whizzed as straight and clean over the ridge of the rock, dropping the line handy to George, and actually within two or three yards of him. Then the life-buoy was fastened to the line, and Davis was signalled to haul it to him.

There was no need, of course, to tell a sailor what else to do, while he had any life at all; but poor Davis was weak and sick, and it was long before he could get the buoy home. When he did, he was too wideawake to take the water where he was sitting, and where the spars of the broken vessel were driving about. He made himself fast inside the cork-ring, and jumped off a clear corner of the rock, and then the crew began hauling him to the boat's side—to which, says the same eye-witness, he came "handsomely," with neck and shoulders clear of the water. But to be towed through a hundred and fifty yards of heavy sea, after being wrecked and pitched among the perry-winkles, and scraped on the limpet-shells, and dashed against stones, and chilled all night to the bone, all this was not exactly restorative; so George Davis was nearly done for when they hauled him into the boat. However, the fine fellows stowed him away snug in the stern-sheets, covered him with their coats, and rowed like mad for Sennen Cove; and when they reached it, they warmed him outside with blankets and a rousing fire, and inside with hot tea and brandy, so that before night he was warmed right through again, and as "good a man as ever."

One fact more should be mentioned in this narrative which looks as if the "little cherub that sits up aloft" really had some sort of hand in the business of mercy. The lady who gave the Sennen lifeboat to the National Institution did it to perpetuate the memory of her husband, Mr. George Davis; and George Davis was the name of the sailor saved in this "Bristol fashion," this "ship-shape" and glorious style. "A coincidence!" of course; but so are all the sudden rewards of well-doing, and all the strange events which display the love of God for poor fallen man.

And yet after all what strikes the mind chiefly in this beautiful story of help is the old inconsistency of mankind. If it is worth while to risk a dozen lives thus to save one life, why on earth should the principle fall short in politics and international relations? Let a craft be cast away on the shores of a Christian land, and scores of sturdy hands will be found to leave home and safety for the blessed hope of

saving a man's existence. Now let the same man be in a row with a hundred thousand others; and, because of Luxemburg, or the Main, or the "balance of power," or some nonsensical trash of diplomacy, give the word of command to blast him to death, or rip him up with grape, or spike him and his fellows with bayonets, and this inconsistent animal man, for a shilling a day and his rations, incontinently obeys. Truly Sophocles was right when he said that of many remarkable things the most remarkable was a human being.

Meanwhile, it is pleasant to note that good seamanship is not on the wane, if diplomacy be. Nothing but the fine hearty sea-craft and finished pluck and skill of British sea-dogs would have done this business. It was no child's-play to coast the Brissons on that Saturday morning, and fish George Davis out of the very jaws of Davy Jones, whose grim "locker" had swallowed up everybody else from the luckless steamer *Devon*. If along our cliffs we still breed such crews as that which Matthew Nicholas steered, the salt is not gone out of our island blood, in spite of these changed times of ironmongery in our Navy, and the death of the beautiful old wooden witches that flaunted the "Jack" of England. Furthermore, if any one seeks a good use for money in this stormy winter time, let him think of sailors, and find out a spot along the coast where there is at present no life-boat—so that from his investment he may some day draw the sweet dividend of human lives saved, and help to make a chain of rescue right round the shores of this Christian land.*

And now reader we will turn to that routine of duty, the lot of that noble society to which the Sennen life-boat belongs. They may well glory in the work of their boat, and hold up such gallant doings as the foregoing tale reveals to those Christian hearts which supply them with the sinews of work, and take the story of the Sennen boat and George Davis as a reward sweeter to them than words can express. Here we find that at their meeting on the 5th of November, Matthew Nicholas, the coxswain of the Sennen life-boat was voted the Silver Medal of the institution, and one pound to him as well as S. Morrison the coast-guard officer each, with twelve pounds to the crew of the life-boat for their services on the above occasion.

This reward might to some appear small; but the Society has large and numerous calls to meet: especially when bad weather prevails. Thus on the occasion of this meeting as much as two hundred and fifty-three pounds were bestowed in rewards, and no wonder need be expressed:—There was the Blackpool life-boat saved twelve men from the schooner *Theodorus* from Liverpool, the Broughty Ferry life-boat saved nine men from the barque *Betty* and *Louise*, of Hamburg, the Great Yarmouth life-boat landed the crew of the *Francis*, of Shields, the Silloth life-boat saved a man from the smack *Rover*, of Annan, the Lytham life-boat saved three men also from the schooner *Theodorus*, and assisted in bringing her safely into harbour, and then again the Society's boats at Stromness, Anstruther, Padstow, and Porthdinllaen,

* The substance of the foregoing appeared in the *Daily Telegraph*.

have succeeded in bringing all these distressed vessels and their crews into port:—the *Victor* schooner, of Grimsby, five hands, the *Active* fishing boat, of Cellardyke, four, the steamer *Augusta*, of Bristol, thirteen, and the flat *William*, of Carnaervon, two: besides these the Society's life-boats at Ilfracombe, Kingstown, Rye, Winchelsea, Chapman's Pool, Port Logans, Peterhead, Dungeness, Tynemouth, Whitehaven, Hasborough, St. Andrew's, Porthcawl, and Girwan, have also all rendered good service in the storms of October, and reckon six hundred and thirty-nine lives saved, and sixteen vessels, from the beginning of the year, all in severe stormy weather.

Viscount Bury, P.C., has received the Institution's silver medal, and Charles Pride, a coast-guard man, one pound, for saving a man of the fishing boat *Alarm*, capsized on Christchurch bar on the 6th of October. The *Blue Vein*, a schooner, of Portmadoc, getting stranded off the railway station at Ballybrack on the 25th of September, was the occasion of five of her men being saved by Edmund Gray, Esq, who has been presented with a silver medal of the institution, and £2 to John Treeny for swimming out with a line to her by which it was effected: and payments amounting to £2,100 were made on various life-boat establishments of the Society, and various other rewards were also granted to the crews of various shore boats, for saving life from shipwrecks on our coasts.

Verily, such reports as these, abounding in cases which would doubtless afford subjects for stories as telling as that of George Davis, amply shew that our life-boat institution in the Adelphi has an abundance of work on its hands. It may well look around for support, and we must not tire of doing good when we see beyond our doors that the weather of our fickle climate is as inexorable as ever.

It is satisfactory to see these services so appreciated as they are,—but we wish that we could see the names of our ship owners more common than they appear to be on the list of *donors!* We understand that their Royal Highnesses the Prince and Princess of Wales, have consented to become the patrons of a grand bazaar to be held at Exeter in the course of next Easter, in aid of the Society's life-boats on the coasts of Cornwall and Devon. And that Admiral the Earl of Carysfort has presented the Society with a second donation of £100, also that the late Mr. C. W. Jones, farmer, of Norwich, has left a legacy of £200 to the institution, and that it has not been forgotten by workmen in the employ of Messrs. Aaron, of Birmingham, who have sent an additional contribution of £5 to the Society. All this is pleasant, and as it should be, and also that a new life-boat is to be stationed at Kimmeredge, on the coast of Donegal—besides the Fraserburgh life-boat being replaced with a new one.

But we must yet record the retirement of Mr. G. C. Begbie, from the office of auditor to the Institution, with its thanks inscribed on vellum for his honorary services, and let us conclude our notice of their proceedings with a *gage d'amour* on the part of Thomas Gray, Esq., the assistant Marine Secretary of the Board of Trade, who has employed his musical powers in producing an elegant song, entitled "The

Life-boat," and presenting it to the Society. It is said, that this piece is to see the light of the musical world in the Quarterly Journal of the Institution. All honour, we say, to all its supporters, and may the song of Mr. Thomas Gray echo his praise from lips of George Davis the cast away of the Brissons, and the noble fellows who saved him from his peril, as well as all their admirers.

A SEAMAN KILLED BY A METEOR.

ON consulting the *Sydney Morning Herald* of August 29th, we accidentally met with a paragraph, headed "killed by a meteor," that we have considered of sufficient interest to preserve here, in the condition in which we found it, without any alteration of matter, but distributing it into paragraphs.

So uncommon an occurrence as that related of a meteor occasioning the death of a seaman, is certainly most remarkable. And although we have seen one, after falling and burying itself in the ground by the force with which it fell (in an ignited condition also), and could certify to its being nearly of a spherical form, and about ten inches in diameter —we would believe that had it struck any one, it would have either maimed him for life, or killed him outright. Yet of the effects of one on the person who should be so close to it, as to be almost in contact with it, we have as yet met with no recorded instance. The following, however, is the plain unvarnished tale, which we can only accept as true, from seeing no motive either for exaggeration or even effects on the sailor whose death it appears to have occasioned. It would seem, however, that Sales (the seaman who was killed by it) must have been very close to it, as it exploded near the stern of the vessel, to have been so affected in his person as the report states he was. From his being at the helm at the time, he would, no doubt, be nearer to it than any one else in the vessel. The account says :—

KILLED BY A METEOR.—The *Brisbane Courier* of the 25th instant, states that several of the vessels just arrived from the southward report that there was a great deal of electrical atmospheric disturbance on Monday and Tuesday nights, 24th and 25th of August, but whether it was the effect of, or was simply coincident with the eclipse, our informants could not say. In one case it was attended with fatal results, and a man was killed on board the schooner *Urania* by the explosion of an electric meteor. The vessel was off Crowdy Head on Monday, August 17th, about midnight, when a heavy south-westerly squall came on, and all hands were called to shorten sail; a seaman, named H. G. Sales, was steering, and at 12 30 a.m. on Tuesday, the 18th, a meteor, like a ball of fire, fell immediately over the vessel's stern, and exploded with a loud report resembling that of a heavy piece of ordnance. Sparks of fire were scattered all about the deck, and the steersman was killed by the shock. Every one on board felt a violent

shock like that of a galvanic battery, bnt none of the crew were injured except Sales, who was at his last gasp picked up. His body showed no marks, but appeared to be blackened, and some six or seven hours after decomposition set in, and the poor fellow was buried over the side. He was a young man, about three-and-twenty, and a smart seaman.

The fire-ball apparently travelled with the wind, which was from the south-west, and when it burst the flash was so intensely brilliant that the steward, who was lying in his berth below, declared that he saw the fire through the seams of the deck. The cabin at the same moment was filled with smoke, which blackened papers lying about. Captain Johnstone informs us that the discoloration of the paint was like that produced by "smoking the ship" with charcoal. A peculiar and indescribable smell was perceived for some time after the explosion, and a quantity of flakes like the soot from a steamer's funnel were scattered about.

Captain Milman, of the *Lady Young* (s.), informs us that on his last trip to Sydney a fire-ball was observed passing ahead of his ship, about one a.m. on Monday, the 17th. It travelled in a horizontal direction from north-west to south-west. Apparently it was so near the ship that the officer of the watch altered her course to avoid it, when it burst, and for the moment the whole heavens seemed to be in a blaze of light; and at the same time there was terrific thunder. Lightning and thunder continued at intervals throughout the night and next day (Tuesday), until about half-past eight o'clock, when the weather cleared up. So says the *Morning News* of Sydney.

Such a display must have been highly interesting, but the portion of the Australian seas alluded to seems to have been the theatre of electric disturbance about that time, for we find the following in the *Melbourne Argus* of the 17th of August, which says:—The schooner *Alcandre*, from Newcastle, New South Wales, arrived in the bay yesterday. Captain Edie states that on the passage from Newcastle, when off Cape Howe, he witnessed an unusual phenomenon—a whirlwind of fearful violence. It came from the S.W. and travelled to the N.E., and passed within one hundred yards of the vessel, lashing up the water to a considerable distance round about. It also caused a terrific noise, succeeded by a calm which continued to the following morning, when a heavy southerly gale set in and lasted for forty-eight hours, carrying away a portion of the bulwarks and staving in one of the boats.—*Argus*, 17th of August.

The following interesting remarks on the former of these subjects appeared in the *Daily News* of the 10th of November, from a correspondent whose clear views on scientific subjects in general, frequently ornament the columns of that intelligent journal.

When we are told that seven and a half millions of meteorites, large enough to be visible at night, fall into our atmosphere in every twenty-four hours, and that ninety-nine out of every hundred of these never pass away again beyond its confines, the question naturally suggests itself—"How far are we safe from the effects of so tremendous a

bombardment?" Granted that the major part of these missiles weigh but a few pounds, yet even so, we seem, at first sight, to be but inefficiently protected. Four-pounder guns, for example, have ere this worked serious mischief in battles and sieges. Nor will astronomers even allow us the comfort of supposing that but few of the heavier missiles from outer space are hurled against our planet. On the contrary, we are told—and there is no reason for disputing the announcement—that many hundreds of the larger sort of aërolites fall in a single day into our atmosphere. The heaviest missiles made use of on board our iron-clads or in our most powerfully armed forts are mere feathers compared to some few of the aërolites which are thus hurled at us. There is now in the British Museum the fragment of one of these aërolites, and this fragment weighs nearly six tons.

Against so tremendous a bombardment as we are thus exposed to, what protection have we? Those who arm our ships with five or six inches, or more of solid iron, what would they do if those ships had to be exposed to the flight of missiles weighing several tons? And our earth is not even armed with one-inch coat of iron. She sweeps onward through space, the continual aim of a flight of bodies of all weights, from a few grains or ounces, to several tons, impinging upon her with velocities which range up to upwards of forty miles in a single second, and yet she seems absolutely without defence of any sort.

The earth is, however, so well defended that none but the largest aërolites reach her surface, and even these are invariably burst into a thousand fragments while penetrating the earth's defensive armour. What, then, is that armour? Those who are loading our forts and ships with defensive armour have made use of one of the strongest and most unyielding of all the substances known to men. The earth, on the other hand, is protected by a substance which is the symbol of all that is soft and unresisting:

> The firmament, expanse of liquid, pure,
> Transparent, elemental air, diffused
> In circuit to the uttermost convex
> Of this great round.

And yet the soft air is for us a "partition firm and sure" from the dangers which surround us, and one might almost imagine that Milton had foreseen the discoveries of modern science when he so described the firmament, and spoke of

> the loud misrule
> Of Chaos far removed, lest fierce extremes
> Contiguous might distemper the whole frame.

Be this as it may, it is certain that the inhabitants of the earth run small risk of being injured by the bodies which come from out the interplanetary spaces. It is doubtful whether a single death since the race of man peopled our globe can be ascribed to this cause; though some will have it that the old fable which refers the death of Æschylus

to the fall of a tortoise dropped on his head by an eagle may be looked upon as the distorted account of the poet's death by the fall of a meteoric body. Many instances have been recorded in which men have escaped from falling aërolites. For example, on October 1st, a remarkable shower of aërolites fell in the department of Yonne; and Baron Seguier relates that a few leagues from Hautefuille, a mason was nearly struck by one of the fragments. The piece, which was found buried deep in the earth near the foot of the mason's ladder, is now preserved in the museum of the Academy of Sciences, to which it was presented by Baron Seguier.

Lightnings of the globular kind are often visible for several seconds; they move in a strange undulating manner; often appearing to avoid objects with which their course would, if unchanged, have brought them into contact; and, at other times seeming to leave their course through the attraction of objects lying near it. They have even been known to rebound (in appearance) from the earth to separate into several small globes, and to exhibit other singular phenomena. Several instances of the effects of globe-lightning resemble very closely those which are ascribed to the object which exploded near the *Urania*. Thus Arago records that on the 13th of July, 1798, the East India Company's ship the *Good Hope*, being in 35 deg. 40 min. S. latitude and 44 deg. 20 min. E. longitude, "was struck by lightning of a globular form, which produced a most violent detonation, killed a sailor instantaneously, and seriously wounded another," and many similar instances might be cited.

No satisfactory explanation of the singular phenomenon of globe-lightning has yet been offered, though probably the account of the matter given by Sir John Herschel in his Treatise on Meteorology is very near the truth. He assimilates the phenomenon to certain appearances which attend the discharge of electricity under particular circumstances artificially brought about. It must not, however, be supposed that any doubt whatever rests on the strictly electrical nature of such events as the one by which the seaman Sales has lately met his death. Everything in the appearance, as well as in the movements, of globe-lightnings distinguishes them clearly from aërolites and shooting-stars. And, besides, it is well known that luminous electrical globes are a common attendant on volcanic eruptions. Sir William Hamilton relates that he and others repeatedly saw such globes during the eruption of Vesuvius in 1779. They issued from the thick cloud of ashes which overhung the volcano, and many of them were of considerable magnitude. "They burst in the air like the fireworks which are filled with what are called 'serpents.'" Similar appearances were observed, also, during the eruption of 1794.

A narrative has just been circulated, under the heading "Killed by a Meteor," in which the death of a seaman on board the schooner *Urania* is ascribed to the fall of a "meteor resembling a ball of fire," and we have seen this narrative referred to in terms which show that the unfortunate man is supposed by many to have been killed by the explosion of a true aërolite. "A seaman, named H. G. Sales," says

the original narrative, "was steering, and at 12.30 a.m., on Tuesday, the 18th, a meteor, like a ball of fire, fell immediately over the vessel's stern, and exploded with a loud report resembling that of a heavy piece of ordnance. Sparks of fire were scattered all about the decks, and the steersman was killed by the shock." "The fire-ball," adds the account, "apparently travelled with the wind, which was from the south-west, and when it burst the flash was so intensely brilliant that the steward, who was lying in his berth below, declared that he saw the fire through the seams of the deck."

In reality, however, the meteor which caused the poor fellow's death was not in any way connected with the class of objects to which shooting stars, aërolites, bolides, and fire-balls belong. In fact, the word meteor, though etymologically applicable to the object seen by the crew of the *Urania*, has become so thoroughly identified with shooting-stars and aërolites that it can hardly be properly made use of in describing the phenomenon. Sales met his death from lightning—but the lightning belonged to neither of the forms (forked and sheet) with which we are most familiar, but to the form denominated by Arago "globe-lightning." In preparing a notice on the subject of lightning for the "Annuaire" of the "Bureau des Longitudes," in 1837, he was led to notice, as a distinct class, lightnings or thunderbolts of a globular form, and also remarkable for the slowness of their movements. At that time he could cite but a small number of well-authenticated facts, but a few years later, when attention had been drawn to the subject and inquiries prosecuted, "he was only embarrassed," he says, "by the difficulty of selection amongst the numerous accounts which he had received."

We may add in confirmation of this concluding remark of lightning causing the death of Sales, that several instances of death by lightning are mentioned in this journal, and a case of the *Calliope*, where the smell of burning sulphur (page 138, Volume 1853,) is mentioned, which case is related in the Volume for 1852 page 468.

The Royal Alfred Belvedere Institution

For Worn-out and Disabled Merchant Seamen.

At a late period of our monthly labours we have received the first report of the Belvedere Royal Alfred Aged Merchant Seamen's Institution, bearing satisfactory intelligence as far as it goes of the condition and future prospects of that almost at present singular home of its kind for our worn out Merchant seamen. Although we may know and deplore that neither our Merchant shipping, nor some of their owners, are all that they should be, our sympathy with their seamen, who are occasionally liable to be sacrificed too often to an unseaworthy ship, has been often enough expressed in this journal, and the institution in question has our best wishes.

We shall, therefore, take the opportunity of introducing the substance of this report to our readers of the Mercantile Marine, and trust that the success of the handsome establishment of which it treats, as it becomes more known, will meet with the encouragement which it has a good right to expect in this, our Maritime country.

The first annual meeting of the Belvedere Institution for Worn-out and Disabled Merchant Seamen, at Belvedere, took place on the 14th November, at the Society's offices, Hibernia Chambers, London Bridge, Southwark.

Thomas Baring, Esq., M.P., President of the Institution, took the chair, and among those present were—William Phillipps, Esq., Captain Sir Frederick Arrow, Deputy Master Trinity House; Captain Hon. Francis Maude, R.N., William Stuart, Esq., Captain Vincent Budd, J. J. Lidgett, Esq., Captain Lean, R.N., Captain R. L. Hunter, James Jackson, Esq., Captain Henry Shuttleworth, William Tillman, Esq., Captain Alexander Henning, R.N., Captain Pook, Captain Liebenrood, R.N., T. R. Edridge, Esq., W. H. Tindall, Esq., Captain Charles T. Ward (late H.M.'s Indian Navy and Lloyd's), George Derbyshire, Esq., J. Bunford Samuel, Esq., Capt. Saunders, W. Harris Saunders, Esq., Nehemiah Griffiths, Esq., Capt. W. H. Symons, R.N., Capt. Osmer, R.N., Captain Henry Toynbee, A. H. May, Esq., and many others.

Captain Tribe, the Secretary, read the following report:—"Your committee desire to express their warm sense of the benevolent perseverance of the committee of the Shipwrecked Mariners' Society, in having brought this much needed institution to the point at which they received it at their hands, and for their generous gift of £5000, and loan of the remainder of the purchase money of the Belvedere Estate, £7148. In accordance with the resolution of the public meeting at the Mansion House, a deputation was formed to wait on the President of the Board of Trade, to press on him the claims of the Merchant seamen to participate in the fund in the custody of the Board, accruing from the unclaimed wages and effects of deceased Merchant seamen. A statement was read by Captain Hon. F. Maude, R.N., and several members spoke to the object the deputation had in view, which was to obtain the assistance of the government from funds in the hands of the Board of Trade, accruing from the unclaimed wages and effects of deceased Merchant seamen. The moral claim of Merchant seamen to be heirs of their brethren, barring no other, was strongly urged. Mr. Milner Gibson replied that the subject should have his careful consideration, and an official answer given to it, which answer, received a few days after, stated that the Board of Trade had no power to give money, but saw no objections to its helping on the pension fund by its organization. A deputation also waited on the First Lord of the Admiralty, his Grace the Duke of Somerset, to solicit a portion of Greenwich Hospital for the object contemplated. His Grace replied that he was very glad of the prospect there appeared to be of a provision in old age for the Merchant seamen, but that he had not the power to appropriate the building at Greenwich to such a purpose.

"On the advent of Lord Derby to office your committee presented a memorial to the First Lord of the Admiralty, praying for a certain quantity of the tables, chairs, and other stores at Greenwich Hospital, now useless in consequence of the complement of the hospital being reduced from 3300 to 600 inmates, to which they received a reply that 'the Admiralty had not the power to make the grant!' They observe that they were the more disappointed, as your institution supplies to the worn-out and disabled Merchant seamen that which Greenwich Hospital, as at present established, does for the superannuated seamen of the Royal Navy. And here your committee would observe that the number of men in the Royal Navy bears no proportion to that in the Merchant Service, the former being about 50,000, while the latter is over 300,000; and as the Merchant seamen as a body had for 138 years contributed to the support of the hospital, they felt the more the refusal of so small a matter.

"Your committee, having been presented with the magnificent house, situated at Belvedere, containing sixty-five rooms, many of them very spacious and exceedingly well adapted for dividing into cabins, have the advantage of being able to provide for the reception of inmates, which they propose shall be five hundred, as the funds committed to their charge will permit. At present fifty have been admitted at three several elections, viz., on December 3rd, 1866, August 1st, 1867, and May 1st, 1868; and twenty-five, having wives or daughters to care for them, have been elected to receive out-pensions, making seventy-five recipients of your bounty. Each inmate has a cabin seven feet by six, with the advantage of a public reading and dining room. The proportion of the several ranks in the Merchant Service of those who have been elected are as follows, viz., Master Mariners, thirty-five; Mates, seven; and Seamen, thirty-three; their ages range from sixty-one to ninety-two.

"Your committee report that the old men find Belvedere very healthy, and that during the past trying winter the sick ward was peculiarly free. They gratefully acknowledge the unremitting care and kindness of your honorary surgeon, R. R. Matthewson, Esq., of Belvedere, which, from the time of his entering on his benevolent office, has been beyond all praise. They congratulate the subscribers on the fact that, on an official visit of the Sanitary Commissioners, they pronounced the drainage and general sanitary system perfect, and observed on the cleanliness of the whole building.

"Your committee acquaint the subscribers that they are prepared to go to parliament by petition next session for aid from the accumulated fund in the hands of the government, derived from the unclaimed wages and effects of deceased Merchant seamen, and other monies collected from the Mercantile Marine; they have also waited, by deputation, on the First Lord of the Admiralty, with a view to obtain a portion of Greenwich Hospital, or some help from its funds, having come to the conclusion, after studying the ancient charters of that institution, that the Merchant seamen have a claim on them—firstly, according to the will of the royal founder; and, secondly, from the

fact that for 138 years the whole body subscribed sixpence per month per man, which in the aggregate, would amount to between £3,000,000 and £4,000,000 of money; and further, they remark, that the Merchant seamen paid their sixpence per month five years after the seamen of the Royal Navy were exempt.

"Your committee with pleasure report that the Mariners' National Pension Fund and Mariners' National Widows' Fund, established in connection with this Institution, with the view of encouraging the rising generation to make provision for themselves in old age, and for their widows, is progressing favourably, and that already a number of young men have insured for pensions varying from £9 to £45 on attaining the age of sixty, or previously, if permanently disabled; and they confidently hope that, on the advantages to be derived from this Fund becoming more generally known among the officers and men of the Mercantile Marine, its value and usefulness will be appreciated by them.

"It is with extreme regret that your committee have to record the death of one of the oldest and most munificent of friends, namely, Arthur Anderson, Esq., Vice-President of the Institution, and late Chairman of the Peninsula and Oriental Steam Packet Company; and also of Admiral the Earl of Shrewsbury and Talbot, one of your Vice-Patrons.

"Your committee acknowledge with great pleasure the hearty co-operation of the honorary agents of the Shipwrecked Mariners' Society who kindly act in the same capacity for this Institution; the Sunderland local committee; the ladies and gentlemen collectors; and the captains who carry collecting boxes and exhibit the framed cards on board their ships, setting forth its objects, thus assisting the good work.

"Your committee have every reason to congratulate their benevolent supporters on the progress the Institution has made, and are happy to say that the old men are grateful for the provision made for them.

"Your committee have not been unmindful to seek high patronage for your noble Institution, and they, therefore, solicited His Royal Highness Captain the Duke of Edinburgh, R.N., K.G., K.T., to become its Patron, and they have now great pleasure in informing you that His Royal Highness has graciously been pleased to accept the office, and that His Grace the Duke of Northumberland has kindly become Vice-Patron.

"In conclusion, your committee desire humbly and thankfully to acknowledge the grace of God in hitherto crowning their labours with His divine blessing; and respectfully press upon the nobility, gentry, merchants, bankers, ship-owners, and the public at large, that in supporting this Institution they are affording a home of peaceful comfort to the friendless and homeless sons of the ocean. They, therefore, confidently appeal to every benevolent heart in the kingdom to help in a work which has for its object the care of England's worn-out and disabled Merchant seamen."

BELVEDERE INSTITUTION, STATEMENT OF ACCOUNTS, BETWEEN MAY 5TH, 1865, AND DECEMBER 31ST, 1867.

DR.	£	s.	d.	CR.	£	s.	d.
To Shipwrecked Mariners' Society (Loan)	7148	0	0	By Belvedere Estate* ...	7148	0	0
„ Balance of Donations and Subscriptions received by the Shipwrecked Mariners' Society after deducting preliminary expenses	1000	0	0	„ Returned to Shipwrecked Mariners' Society, paid to Bankers in error	299	6	1
„ Donations	5029	9	3	„ Paid to ditto, part of Loan	3000	0	0
„ Subscriptions (Annual)	801	2	3	„ Fixtures	563	15	3
„ Legacies	69	19	0	„ House Expenses and Repairs	718	6	7
„ Rent of Park, Stables, etc. (Belvedere)	125	13	6	„ Provisions	301	9	11
„ Interest on Deposit ...	83	15	10	„ Out-Pensions	106	0	0
„ Sale of Material	2	14	9	„ Salaries	468	16	5
				„ Commission	84	4	1
				„ Advertisements	358	12	11
				„ Printing and Stationery	308	14	11
				„ Postage and Parcels...	38	13	2
				„ Travelling and other Expenses	253	9	5
				„ Cash at Bankers', and in hand	611	5	10
	£14,260	14	7		£14,260	14	7

Examined and found correct,

GEORGE DERBYSHIRE, Bankers' Clearing-house, } Hon.
J. BUNFORD SAMUEL, Stock Exchange, } Auditors.

The Chairman, in proposing the adoption of the Report, said the principal object of their assembling on this their first annual meeting, was to consider not only their present success, but, if possible, to increase their prosperity, and to promote the usefulness of the Institution. He did not think that they had any need to despond if the Society had not attained the position they could have desired, as it was the result of a variety of circumstances which had operated upon all charities. But they had attained, although perhaps a simple, yet a satisfactory position, and had brought into operation a valuable institution (hear). They had acquired an establishment which was signally well adapted for the purpose for which it was intended. The great object the committee had in view was to get out of debt; and it was very satisfactory to find that they had been enabled to pay the Shipwrecked Mariners' Society £3000, part of the loan which had been made them, and also to advance the fund so as to increase its usefulness. It was for them to consider how that was to be accomplished. They were aware that an application to Government

* Belvedere House, "with 23 acres of land," was purchased by the Shipwrecked Mariners' Society for £12,148, and handed to the Trustees, they to pay back £7148, the Society giving £5000 as a donation. The interest on the loan, at 4 per cent., has not been paid.

had been unsuccessful, and if they should be unable to get any aid from parliament, it would be a matter for consideration whether a committee should not be formed with a view of devising some means of obtaining a material addition to the funds—(hear, hear). The Society was one which should command every sympathy and support. It was to the British seamen that they were indebted for manning their fleet and developing and extending the trade of the country. They also knew that from the peculiar nature of the employment of sailors they were not able to provide for sickness and old age, and it, therefore, behoved those who had it in their power to make some effort to relieve those who, in their time, had rendered important service—(hear, hear). In other countries he (the Chairman) believed that some provision was made by the Government for relieving distressed seamen, and he hoped that they should not be behind in such a Christian work—(hear, hear). The building at Belvedere was capable of accommodating five hundred inmates, but there were only fifty, and he thought that they should all put their shoulders to the wheel and endeavour to admit a larger number of deserving applicants, and so increase the value of the Institution—(cheers). He concluded by moving—

"That the Report now read be received and printed for circulation, with the historical report of it by the Shipwrecked Mariners' Society. That the following gentlemen be elected members of the committee, viz.: —William Phillipps, Esq., Chairman; Capt. Hon. Francis Maude, R.N., Deputy-Chairman; Thomas Brassey, Jun., Esq., Capt. Vincent Budd, John Candlish, Esq., M.P., The Rt. Hon. Lord H. Cholmondeley, John De Putron, Esq., Capt. C. R. Egerton, R.N., John T. Fletcher, Esq., Nehemiah Griffiths, Esq., Rear-Admiral Sir William H. Hall, K.C.B., F.R.S., John Holman, Esq., Captain R. L. Hunter, James Jackson, Esq., D. J. Jaffe, Esq., Capt. Lean, R.N., Francis Lean, Esq., R.N., J. J. Lidgett, Esq., W. S. Lindsay, Esq., Capt. Littlehales, R.N., Capt. Charles E. Mangles, H.C.S., Capt. Peter Maxton, Capt. Sir John Heron Maxwell, Bart., R.N., J. J. Mayo, Esq., John Riley, Esq., Capt. Henry Shuttleworth, S. William Silver, Esq., Frederick Somes, Esq., William Strang, Esq., William Stuart, Esq., W. H. Tindall, Esq., Hon. C. Hanbury Tracy, M.P., George Otto Trevelyan, Esq., M.P., Capt. Trivett, Lieut. R.N.R., T. R. Tuffnell, Esq., Capt. H. J. Ward, Rear-Admiral Warden, C.B., Charles Hampden Wigram, Esq., Anthony Wilson, Esq., Rear-Admiral Young, Allen Young, Esq., Lieut. R.N.R.

Captain Pook seconded the resolution, which was unanimously adopted.

Captain Sir Francis Arrow, Deputy-Master of the Trinity House, then moved—"That this meeting begs to express its acknowledgment of the honour that has been conferred upon the Institution by H.R.H. Capt. the Duke of Edinburgh, R.N., K.G., K.T., in becoming its Patron, and allowing it to take his own name, as "The Royal Alfred Belvedere Institution for Disabled and Worn-out Merchant Seamen," at Belvedere-on-Thames; and that the best thanks of this meeting be conveyed to His Royal Highness." He might be allowed to add, that from his own personal knowledge His Royal Highness took a deep

interest in everything connected with the Mercantile Marine, and that, holding the position he did as Master of the Trinity Corporation, the success of this Institution would afford His Royal Highness considerable satisfaction—(applause).

The Hon. Captain Maude, R.N., seconded the resolution, and said they had every reason to congratulate themselves upon having such a chairman on this their first annual meeting. It was an admirable institution, and although they had not realized the full extent of its advantages, he hoped they would soon have an increase of inmates, and not only have the number, five hundred, for which the building was intended, but that they would have the same thing in Liverpool and Bristol, and other ports. Indeed, it afforded him some satisfaction to perceive that a start had already been made at Liverpool to establish an institution of the kind (hear, hear). Perhaps he might be allowed to read the following note, which he had received from an applicant:—"I trust you will pardon me with troubling you in soliciting your votes on my behalf to become a pensioner of the Belvedere Institution for Disabled and Worn-out Merchant Seamen, of which I became a donor of £2, and an annual subscriber June 19, 1867. I was seventy-eight years of age last April; late Master Mariner. I was compelled to discontinue following a seafaring life (after following it for fifty years) in consequence of old age and epileptic fits; that I, your petitioner, having no wife, she dying in last March, after being blind and paralysed for upwards of thirty years, do humbly pray that you will be pleased to favour me with your support." He could not imagine a more touching appeal than this, and it was to meet such cases that the institution had been formed—(hear). He trusted that they would prosper, and by an increase of funds extend their aid to those who, from no fault of their own, could not help themselves.

The resolution was passed.

Mr. William Phillipps then moved—"That this meeting hereby expresses its thanks to the Shipwrecked Mariners' Society for its unwearied labour in aid of establishing this institution, purchasing the house and estate, and consigning it, with the munificent donation of £5000 towards its cost, to this committee." He felt that he could not do justice to the resolution, for a more noble act on the part of a public body it would be difficult to find—(hear). Without this generous aid they could not have attained the position they had. Now that they had received Royal patronage through the exertions of Sir Frederick Arrow, he trusted that an impetus would be given to their exertions—(hear). It was only to look round and witness the result of their work. The old sailors, inmates of the institution, had spent their best days in the service, and, now that they had grown old and unfit to work, it was their duty to make some provision for them. Mr. Phillipps then alluded to the circumstance that an old seaman having saved £200 out of his wages, wished to become an inmate of the asylum on the payment of that sum into the funds. There was some difficulty in the matter, one of the regulations providing that, in his special case, the amount should not be less than £300. However,

there were some gentlemen who, by virtue of their subscription, had the right of presentation, and this noble old man, who had saved £200 out of his hard-earned wages, was at once admitted into the institution, and he was present to express, in his own words, the treatment he received—(cheers). It was satisfactory to know that they were getting out of debt, and he had the most sanguine hopes that they would add to their funds and extend their sphere of usefulness—(applause).

Mr. James Jackson said he had much pleasure in seconding the resolution so ably moved by their excellent, warm-hearted friend Mr. Phillipps, and in doing so begged sincerely to thank the Shipwrecked Mariners' Society for their princely donation—(cheers). It appeared to him most essential that the objects of the institution should be made more generally known, and meetings held in the large manufacturing and inland towns. Manchester, Birmingham, Sheffield, and Leeds are equally as much indebted for their prosperity to the Mercantile Marine as London or Liverpool—(cheers). He thought the present a favourable opportunity for electors in the various seaports to ask the candidates if they are prepared to request from the government a restitution of the funds in their hands belonging to the Mercantile Marine contributed by our Merchant Shipping to Greenwich Hospital, and collected from wages and effects of deceased seamen by the Board of Trade, and he believed if Maritime members would unitedly and energetically urge this matter upon the Government they would be successful—(cheers). He trusted that such a response would be given to the appeal about to be made to the public, that it could no longer be said proud and wealthy England neglected the men to whom she is so deeply indebted, as the Commanders, Officers, and Seamen of her important Merchant Navy—(loud cheers).

Mr. W. H. Saunders, in a few appropriate remarks, supported the resolution, which was carried.

The Chairman here invited several of the old pensioners to express themselves as to their treatment in the institution and whether they were comfortable. They said they were very grateful that the gentlemen had provided them with such an asylum, and that they were happy. The old seaman who paid in the £200 which he had saved out of his earnings, to be admitted into the building, said he was happy; and a fine old fellow, said to be more than ninety years of age, made his way up to the table, and said he was nice and comfortable in the place, and was very thankful to the gentlemen. In answer to Mr. Phillipps, the old veteran said he had his pipe, and they all had to thank Captain Tribe for his attention to them.

Captain Shuttleworth then, in a few words moved the following resolution:—"That this meeting thankfully and gratefully acknowledge its obligation to the honorary officers—viz., the treasurer, auditors, secretary, solicitor, surgeon, and chemist; also the honorary agents, ladies and gentlemen, and Captains of ships, who kindly collect, for the active and benevolent support they have given to the institution, with special mention of Mr. R. R. Mathewson, the honorary surgeon,

whose valuable and ever-anxious care and attention has been given to the inmates of the house by night as well as by day."

Mr. J. J. Lidgett seconded the resolution, and urged that Captains who collected £5 should have a vote for the election of pensioners. The resolution was carried.

Captain R. L. Hunter, the Deputy-Chairman of the Local Marine Board, proposed that the thanks of this meeting be given to the committee of the Shipwrecked Mariners' Benevolent Society for the use of their room. It was satisfactory to find that the institution was progressing, and had now the countenance of Royalty, and the Corporation and the City Companies. They were getting better known, and he was rejoiced that it was so, for theirs was nearly the only civilized part of the world that had not made some provision of the kind—(hear, hear).

Mr. George Derbyshire seconded the motion, which was agreed to.

Captain Hemming, R.N., then proposed—"That the thanks of this meeting be accorded to Charles Hampden Wigram, Esq., for the kind attention and valuable time he has afforded to the interests of this institution during his office as Chairman; and to Francis Lean, Esq., R.N., for his past and continued services as honorary secretary;" and remarked upon the presence of the old tars, which afforded ample proof of the great value of the institution.

Captain C. T. Ward supported the resolution, which was passed.

Mr. William Phillipps then in very complimentary terms, moved—"That the cordial thanks of this meeting are offered to Mr. Baring for the able and courteous manner in which he has presided over it, and for the kind interest he takes in the welfare of the institution;" which being seconded by Sir F. Arrow, was carried unanimously.

The Chairman replied: The duty which had devolved upon him that day was of a very pleasing character, and he should always be but too happy to render any aid he could to the institution. He repeated his suggestion that it would be well that they should form a kind of committee—say, after the elections were over—with a view of getting an increase of funds, and giving them, as it were, a fresh start.

Captain Shuttleworth moved, and the Chairman seconded—"That the thanks of this meeting be given heartily to Mr. Wm. Phillipps, and the other working members of the committee, Captain V. Budd, Mr. J. Jackson, Hon. Captain F. Maude, Mr. S. W. Silver, Captain Trivett, and Rear-Admiral Warden," which was adopted.

The proceedings then closed.

We quite agree in the foregoing remarks, that the large sum contributed by the Merchant seamen of this country, in years gone by, entitle them to some acknowledgment on the part of the Government, that could not be better made than in a parliamentary donation to this institution—thereby helping to set it free from debt, and in the position as realizing its actually intended condition. The fact of such an institution, from want of funds, being obliged to limit its inmates to one-tenth of what they should be, is discreditable to the country.

There are various ways of improving its resources by wide-spread small subscriptions, which we cannot but think would be largely patronized in the country generally, while there are many parties in the list of our ship builders and merchants who should be the first to answer an appeal handsomely made to them to forward an institution that gives a happy asylum, as this does to the noble fellows who have been working hard for them, which asylum is to sweeten the parting years of their lives. The British seaman who has served the State is looked after in his declining years: the Mercantile seaman who has served the merchants of the State, who has made their fortunes for them, besides enriching the State, and placing their country in its present high position, should be looked after according to his means by every one in the land. We commend to the attention of our readers this first report of the Belvedere Institution for Worn-out and Disabled *Merchant Seamen* of England, who, under her own laws, have placed her the highest among the nations in the annals of navigation and trade.

THE NOVEMBER STAR-SHOWER.

THE magnificent display of falling stars seen on the morning of November 14th, 1866, led many to watch, last November, for a recurrence of the phenomenon. Astronomers were not very positive, indeed, in asserting the probability that the shower would be seen. The full moon was shining, too, throughout the morning of November 14th, and a haze overspread the sky towards the hour at which the display was expected to attain its maximum of brilliancy; so that even if stars had been falling in considerable numbers, few could have been seen. But, as a matter of fact, had the night been ever so clear, we should have seen no shower; for it is now well known that the display took place elsewhere. The sun had risen two hours in England when the earth commenced her passage through the denser strata of meteoric bodies.

It cannot be considered that astronomers were very far out in their reckoning. In fact, those who are most familiar with the doubts which at present hang over our knowledge of the November star system are rather surprised at the close coincidence which existed between the estimates of our astronomers and the recorded event than at the fact that the display did not take place precisely at the expected hour. In 1866, astronomers had been far less happy in their calculations, notwithstanding the splendour of the display which rewarded those who watched on the morning of November 14th. It was confidently anticipated that the shower would be seen to the best advantage in America; and so doubtful were astronomers as to the exact hour of the display in England, that Mr. Alex. Herschel (who

was justly recognised as the leading English authority in the matter) pronounced the 13th as the day on which the shower was most likely to take place.

Last year, as we have said, astronomers were bold enough to announce, though not with absolute certainty, the probable hour at which the display would attain its greatest brilliancy. That hour was 7.20 a.m., November 14th. The event, while justifying the general accuracy of their calculations, occurred long enough after the hour named to prevent observers in England from seeing any save a few straggling meteors which lay on the confines of the meteoric stratum through which the earth was presently to pass.

This want of exact coincidence between the predictions of astronomers and the actual epoch of the display prevents our pronouncing with any confidence on the subject of the display of the present year. We now know that the earth takes but a short time—six or seven hours, perhaps—in passing through the meteor zone. If the passage happens to take place while it is early morning with us, we shall see the display, weather permitting; but if the passage take place during any other part of the twenty-four hours, we shall see nothing of the shooting stars. So far as calculation may be depended upon, it is more likely that we shall miss the spectacle than that it will be well seen. But, as we have said, there is no certainty on the subject. The chances are about equal that the 13th or the 14th of November will be the day of the display, if the meteors are seen in England. If the calculations of astronomers are justified by the result, we may see a few "stragglers" late on the morning of the 13th, and a few more early on the morning of the 14th; the former will belong to one side of the meteor bed, the latter to the other side, and the denser parts of the system will have been passed through in the daytime on the 13th.

Putting prediction on one side, let us pass on to speak a few words about the remarkable discoveries which astronomers have made during the past two years respecting the November meteors.

When we watched the display of November 14th, 1866, we had but faint conceptions of the magnificence of the scheme to which the stars we saw belonged. Astronomers themselves had been unwilling to accept the theory that the recurrence of periodic maxima some three times in a century indicated that the zone of meteors had that enormous extension which corresponds to a period of revolution of thirty-three years. It was shown that if the meteors really revolved in such a period their orbital motions must carry them far out in space beyond the orbit of the distant planet Uranus. Therefore astronomers attempted to show that the meteors may possibly revolve in an orbit somewhat smaller than that of our own earth, the richest part of the zone circling round in less than a year, but encountering our earth once only in thirty-three years. But the calculations of Adams have proved beyond all possibility of doubt that the zone of meteors really has the enormous extension indicated by the former view. The meteors which we watched in 1866 had come from beyond the orbit of Uranus, and we might almost say that they were connected by a continuous stream

of their companions with those far distant regions of space which lie between the orbits of Uranus and Neptune. But this is not all. One of the most suggestive discoveries ever made by astronomers is associated in an intimate manner with the November shooting-star system. We believe that the Italian, Sehiaparelli, was the first to notice that the August meteors seem to travel in the track of the great comet of 1862. The coincidence between the meteor zone and the orbit of that comet was sufficiently close, when a certain assumption was made respecting the paths of the meteors. The assumption was permissible—at least nothing was known about the meteors which seemed to negative it. But a certain amount of doubt naturally clung round a theory which required an antecedent supposition of this sort. But as soon as the actual orbit of a meteor system was determined, it was hoped that more satisfactory evidence might be obtained on the subject of the supposed connection between comets and shooting-star systems. Therefore, astronomers began to examine the lists of cometic orbits to see if any of them agreed with the orbit assigned to the November meteor zone.

For some time the search was unsuccessful. None of the larger and more conspicuous comets showed any such approach to coincidence as had been looked for. But at length, when the inquiry had been extended to telescopic comets, one was found which presented the required elements. This comet had been discovered by Dr. Tempel, early in the year 1866, and it has been well pointed out that the coincidence by which the discovery of the comet fell in the very year in which the problem of the November shooting stars was finally solved, is among the most interesting of the many coincidences which have been recorded in the annals of science.

The agreement between the orbit of Tempel's comet and that of the November shooting stars is too close for any doubt to remain that a real association exists between the meteors and the comet; and since the discovery of the association we have pointed out, other shooting-star systems—for many are recognised by astronomers—have been examined, and in several other instances it has been found that a similar association connects comets and shooting stars.

We think this discovery may fairly be looked upon as one of the most remarkable ever made. Astronomers have long recognised in comets the most perplexing objects presented to their contemplation. What comets are made of, whence they come, how they escape destruction when they come so close to the sun, whence and how their enormous tails are generated, these and a hundred such questions have been asked, and it had almost seemed hopeless to expect a satisfactory answer to any one of them. But now, it turns out, that year after year, for upwards of sixteen centuries, the earth has been passing through what may be looked on as the tail of a comet. Our star-gazers have wondered as they saw the sky covered with meteors, but they would have wondered more had they known the real meaning of the phenomenon. And then how many startling considerations are suggested by the fact that the comet to which all those brilliant dis-

plays have been due is a telescopic one—that is, is so minute that the acutest vision would be unable to detect it without the aid of the telescope. If we passed through the tail of any of the more brilliant comets how gorgeously would our skies be lighted up with flashing meteors, when this tiny mist, altogether invisible to the naked eye, is capable of producing such magificent displays.—*Daily News.*

Atlantic Currents.

There is always something worthy the attention of seamen in discussions on currents of the ocean, that affords us sufficient reason for preserving the following from the columns of the *Daily News* :—

The *Moniteur* describes the results of a series of interesting observations made by M. Savy on the waters of the Atlantic Ocean. The subject is an important one, on account of its connection with the currents of that ocean. We proceed to discuss the principal facts disclosed by M. Savy's researches, and also the speculations which he founds upon them ; but we must premise that in examining the formation of the Atlantic currents he has omitted to consider the most important cause of all—or, we should rather say, the motive cause of the whole system of Atlantic circulation. We have noticed a corresponding omission in nearly all the principal works in which the subject of ocean currents is discussed ; we shall point out the nature of the omission in the sequel.

M. Savy finds that the density of the Atlantic varies in an uniform manner along the same meridian, from pole to pole. The lightest water is found under the equator. Thence the density of the water increases towards either pole up to a certain latitude, beyond which—in the northern hemisphere certainly, and doubtless in the southern also—there is a diminution of density probably extending to the pole itself. In the northern hemisphere the density of the ocean is greatest between the parallels of 40 and 60 degrees. In the southern hemisphere an increase of density has been observed up to the 60th parallel, beyond which observations have not yet been extended. We may notice, in confirmation of M. Savy's results, that Captain Maury describes the water around Cape Horn as the densest in the southern hemisphere. The densest sea-water in the northern hemisphere is found according to the same authority, in the sea of Okotsk, so that it appears that the law M. Savy has pointed out in the case of the Atlantic extends also (as might be anticipated) over the Pacific Ocean.

It is not difficult to account for the peculiar variation of density observed in the waters of the ocean. Over the whole ocean two vary-

ing causes are at work to affect the density of the water. Each of these causes has a maximum effect at parts of the ocean where the density is observed to have its minimum value. At the equator the heat of the water is greatest, and on this account—if no other cause were in operation—the water should be lighter there than elsewhere. At the poles the water is less salt than elsewhere (because of the continual dissolution of icebergs, which contain no salt); and on this account—if no other cause were in operation—the water should be lighter there than elsewhere. Now if one of these causes were absolutely insignificant in comparison with the other, we should find a continual increase of density either from the equator to the poles or from the poles to the equator, according as the influence of temperature or of saltness on the density were the more important. But as a matter of fact, although not absolutely equal in effect, the two causes have each a sufficient influence to enable them effectually to counterbalance each other. And, further, the influence due to either cause extends (effectively) to but a limited distance from the place where it attains its maximum value. The flow of fresh water from melting icebergs scarcely has any influence in latitudes lower than the parallel of 50 degrees. The decrease of density due to heat is not, indeed, limited in exactly the same way; but it acts far more effectively in equatorial than in arctic regions. For example, an increase of temperature of five degrees in the case of sea-water already heated 90 degrees will produce a change of density about 40 times as great as a similar increase in the case of sea-water nearly at the freezing point. Accordingly, at the poles, where the diminution of the sea-water's density, owing to deficiency of salt, has its maximum effect, this cause is able to more than counterbalance the increase of density due to cold, and thus a minimum density results in this neighbourhood; and in like manner a minimum results under the equator, because the great diminution of density due to heat is not counterbalanced effectively by the increased saltness of the water. It follows, of course, that in some latitudes between the equator and either pole the density of the water attains a maximum value.

M. Savy follows Captain Maury in attributing to this distribution of density the whole system of oceanic circulation. At the equator, where the water is lightest, it rises to the surface, and sends a wave to each pole. "This supply of light water proceeds to the higher latitudes, where it covers over the heavier strata, but by this time it has lost its caloric, and become heavier in its turn; so it sinks to the bottom, and is drawn towards the pole by the lightness of the water there. Thence, the same aqueous stream, having become heavy by concentration, returns by a submarine current to the equator, where it plays the same part over again." The combination of the motions here described with the earth's motion of rotation, accounts, in M. Savy's opinion, for all the great currents existing on the surface of the Atlantic, viz.: 1, The great equatorial current; 2, the current which runs along the border of the equatorial stream; 3, the current of the northern Coast of Guinea; 4, the Gulf Stream; 5, the cold

water currents from the poles; 6, those of the same temperature under the equator; 7, the cold water in the vicinity of the Cape Verd Islands; 8, the western current there; 9, the cold streams on the coast of Guiana; 10, the *prororoca* there; besides explaining the low temperature of the deep waters under the equator, and the warmth of the deep water in the polar regions.

Now, when Captain Maury used reasoning similar to that of M. Savy, Sir John Herschel, who had pointed to the trade winds as the true cause of ocean currents, was able to overthrow the whole hypothesis by simply asking why all this complicated system of motions should result from the lightness of the water under the equator. M. Savy says, the water being lightest there rises to the surface and sends a wave to each pole. We ask, with Sir J. Herschel, why does it do so? If it rose above the mean level we might expect that it would flow off as suggested. But it is only lighter in consequence of the expansion due to its heat; and the extent of this expansion may be readily calculated. Sir John Herschel has gone through the requisite processes, and he finds that there would result a slope so insignificant as to be utterly unable to generate any such downflow as would correspond to the velocity of the ocean currents. This reasoning is perfectly conclusive against Maury's views as he presented them.

Yet there can be no doubt that the oceanic circulation is due to the cause assigned by Captain Maury and M. Savy, and not to the trade winds, as suggested by Sir J. Herschel. Maury's reasoning against Herschel's view is fully as conclusive as Herschel's reasoning against Maury's. Maury justly asks how an intermittent cause like the trade winds can produce a persistent phenomenon like the oceanic circulation. Besides, it is easy to show that the total amount of force exhibited in the atmospheric is considerably less than the total amount exhibited in the oceanic circulation — a circumstance perfectly conclusive against Herschel's reasoning.

The fact is, that the true moving cause of the oceanic currents is indeed the sun's heat. But it is not the influence of this heat in diminishing the density of the water under the equator which sets the complicated system of circulation in action. In the fact that the sun's heat evaporates enormous quantities of the sea-water under the equator, and that the water thus carried off has to be continually supplied by an inrush from below, lies the true explanation of the oceanic circulation. The inrush cannot come in from above, because the region over which the process of evaporation is going on extends for many hundreds of miles on either side of the equator. Therefore the water must pour in from below, a circumstance which accounts for the coldness of the deep water under the equator. The water thus flowing in having come from higher latitudes appears on the surface with a westerly motion, for the same reason precisely that the trade winds blow towards the west. An initial movement being then given, the variations of density described above suffice to maintain the circulation precisely in the way explained by M. Savy.

Nautical Notices.

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

THE PAGET REEF—*Off the Great Barrier: Australia.*—A searching overhaul of a file of Sydney papers for something new, has been amply rewarded by the following hydrographical discovery. It is somewhat marvellous that so important a piece of information as it discloses, should have been lying dormant in the *Brisbane Gazette*. The old, well-known line of Gray;—

"Where many a flower is born to blush unseen,
And waste its sweetness on the desert air!"

might almost be quoted in revenge for the neglect which has allowed this so long to remain unobserved, in that desert of inattention to the seaman's requirements that seems to afflict even the government atmosphere of Brisbane, the great seat of all authority for Queensland, in distant Australia. Else, why had it not found its place in the chart long before our prying scrutiny snatched it from its neglected condition? the story which it unfolded for the seaman, wasting its virtue in the musty mazes of printed papers in that part of the world? Is there no one in that district of our extended colonies, that knows the sailor's wants, who could possibly prevent such information from being thus neglected as concerns his very safety, and from being shut up in books so long as this has been without being made known at the fountain head of Hydrography in the British Admiralty? Yet such appears to be the fact; and we find ourselves the first to extricate it from such obscurity, and to give its claims to attention in the atmosphere of England through the pages of this work. It is no bulky affair, but a veritable *multum in parvo*, as will be seen by the following paragraph, quoted from the *Sydney Morning Herald* of the 3rd of September last:—

"NOTICE TO MARINERS—Captain Paget, of the schooner *Marion Renny*, reports the existence of an extensive reef from latitude 18° 52′ S. longitude 152° 42′ E., to latitude 19° 10′ S. longitude 152° 14′ E., discovered on the passage from the South Sea Islands towards the Great Barrier. The *Marion Renny* ran along the weather-edge of the reef for four hours, the vessel going seven knots an hour; three sand banks large in extent, but not very high, were observed on the reef."—*Government Gazette.*

This information of a reef above twenty miles in extent on which were seen three dry sandbanks makes it as important as the Lihou Reef in the charts, and others off the Barrier from which it is respectively about a hundred miles distant, and in an apparently deep and clear sea. We have learnt that Captain Toynbee, now of the Board of Trade, has skirted its outer end, still the chart innocently gave a clear sea in its position. There can be no doubt of its great *extent* as the *Marion* sailed for four hours, going seven knots along its southern edge, and discovered "three sand-

banks" on it "not very high," and therefore the more dangerous. But the position of its limits requires confirmation, and this important duty, we trust, will be assigned, as indeed is required, to a competent naval authority on that coast. From the attentive consideration of the officer commanding the *Marion Renny*, we have distinguished it by the name of the *Paget* reef, a favourite name among Englishmen, concise and terse enough not to crowd a chart.

Particulars of Lights Recently Established.

(Continued from page 623.)

Name.	Place.	Position.	F. or R.	Ht. in Ft.	Dist seen Mls	[Remarks, etc. Bearings Magnetic.]
100. Portsmouth	Approaches	Buoys	...	...	...	See Notice No. 100.
101. Libau	Baltic	56° 31′ N. 21° 0′ E.	R.	103	12	Est. — Light once a minute, duration 5 seconds.
Hango Head	Gustafsod Island	W.E. point	F.	...	...	Est. 1868. Red to entrance of Road; White to Anchorage.
Selskar Island	Aland Islands	G. Bothnia	R.	...	...	Est. August, 1868, shewing red and white alternately for 30 seconds.
Snipan Bank	N.W. extreme	Ditto	F.	20	7	Est. August, 1868, vessel, removed for winter on 20th October.
102. Connimicut Point	Rhode Is.	Providence River	F.	50	11	Est. 5th November, 1868.
Block Island	Long Island Sound	E. Entrance	F.	75	12	Est. 15th September, 400 yards Sonth of former.
Brewerton Ch.	Hawkins Point	Patapsco River	...	28	...	Est. 1st November, 1868. These lighthouses bear N.W. and S.E. from each other 1 mile aud ⅛th apart.
			...	70	...	
	Leading Point	... ...	...	70	...	
Wolf Island	Doboy Inlet	... ...	F.	31	10	October, 1868. Re-established.
			F.	38		
103. Wrecks near	The Nore	and Calshot	...	...	...	See Notice No. 103.
104. Itacolomi Point	Maranham	S. America	...	...	...	Lighthouse destroyed by fire.
105. Bustard Head	Australia	24° 1·3′ S. 161° 42′ E.	R.	330	24	Est. 1868. The light continues one minute, followed by total darkness of one minute; in which last interval a flash appears.

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

No. 100.—England—South Coast.—*Alteration of the Buoys marking the approaches to Portsmouth Harbour, including the Looe Stream.*

With reference to Notice to Mariners No. 33, dated 9th April, 1868, describing the intended alterations in the buoyage of the approaches to Portsmouth Harbour;—Notice is hereby given that in conformity therewith, the following alterations have been effected.

Needles Channel and Solent to Spithead.

Names of Buoys.	Former Character of Buoys	Character now Established.	Names of Buoys.	Former Character of Buoys.	Character now Established.
S.W. Shingles buoy	Red	Red and white chequered (conical).	Prince Consort...	White	Red (can).
Elbow ...	Black and White striped... ...	Red and White striped vertically (can).	Calshot Spit (a refuge buoy) remains ...	... ...	Black.
N.E. Shingles ...	Red and White chequered ...	Red and White bands (can).	Old Castle buoy	White	Red (can).
Warden Ledge ...	Black	Red (can).	N.E. Bramble... ...	Black and White chequered ...	Red (can) and marked HILL HEAD.
Black Rock	White	Red (can).	East Bramble... ...	White	Red and White striped vertically (conical)
Lymington Spit ...	Red	Red and White chequered (can).	West Middle buoy	Black	Red and White bands (can),
Hampstead Ledge ...	White	Red (can).	East Middle	Black	Red and White bands (conical)
Salt Mead	White	Red (can).	Peel Bank	White	Red.
Lepe Middle	Black	Red and White striped vertically (can).	West Sturbridge ...	White	Black and White bands (can).
Gurnet Ledge ...	White	Red (can).	East Sturbridge ...	White	Black and White bands (conical).
Thorn Knoll ...	Black and White chequered ...	Red and White bands (can).	Sand Head	Red and White chequered	Black and White chequered.
West Bramble	Red	Red and White chequered with staff and a cage (conical).			

Eastern Entrance to Spithead.

WESTERN SIDE.			EASTERN SIDE.		
Names of Buoys.	Former Character of Buoys.	Character now Established.	Names of Buoys.	Former Character of Buoys.	Character now Established.
S.E. Princessa buoy	Black	Black and White chequered with staff and cage (conical).	Shelly buoy	Red and White bands	Black (conical)
N.W. Princessa buoy	White	Black and White striped vertically (can).	Eastborough Head ...	Black and globe	Black and White chequered, with a staff and cage.
Bembridge	Black	Black and White chequered (can).	Owers Middle... ...	Black and White striped... ...	Black and White chequered (can).
Nab Rock	Red	Black and White bands (can).	Pullar ...	Red	Black and White striped vertically (conical).
			Street ...	Black and White chequered ...	Black (conical).
			Bullock Patch ...	Red	Black (can).
			Boyne (wreck)...	White	Green (nun).

NOTE.—The No Man's Land, and the Horse buoys have been removed.

Entrance to Portsmouth Harbour—The buoys marking the port side of the channel in entering are chequered black and white; and those marking the starboard side are black.

No. 103.—The wreck of the ship *Leichardt*, being dangerous to navigation, a vessel, showing a *fixed* white light, has been moored about a cable to the eastward of the wreck, and will be kept there until further notice.

This vessel with the warning light lies in 5 fathoms at low water springs, with the following marks and bearings;—Miletown mill midway between Miletown church and a tall chimney, W.S.W.; South church in a line with a small house on the beach and Thorpe Hall open right of the church, N.N.W. ¼ W.; Nore light vessel, W. ¾ N. $\frac{5}{10}$ths of a mile; South Shoebury buoy, N.E. ½ N. 1½ miles; Cant buoy, S.E. ¾ E. 2¼ miles.

A *green* buoy, marked with the word *Wreck*, has been placed 20 fathoms to the southward of the wreck, the Nore light vessel bearing W. by N. about three-quarters of a mile.

Also the wreck of the barge *Enterprise*, near Calshot light vessel, being dangerous to navigation, a spar has been fixed to the mast of the wreck, from which a white anchor light will be exhibited, so long as the condition of the wreck and the state of the weather admits.

All Bearings are Magnetic. Variation 20° *Westerly in* 1868.

NOTES OF NOVELTIES.

IT is somewhat remarkable, that if the Russian Navy has suffered the loss of a frigate, the *Alexander Newski*, as reported, so have we in the loss of the *Rattler* on the north coast of Yesso, of Japan. Officers and crews of both vessels saved, but as yet no particulars given.

The following report concerning H.M.S. *Challenger* from the *Hants. Telegraph*, is referred to in a former page on the Fiji islands.

Villages Shelled by Boats of H.M.S. Challenger.—The schooner *Gem*, which arrived at Sydney on the 2nd of September, conveyed the intelligence that her Majesty's ship *Challenger* had proceeded to the island of Rewa (Fijian group), and armed boats were dispatched up the river for the purpose of punishing the hostile tribes that had been implicated in the murder of the Rev. Mr. Baker and others connected with the mission. The launch and first and second cutters were armed, and placed under the command of Captain Browning, with orders from Commodore Lambert to shell the villages. This was done, and it is supposed that several of the natives were killed, the casualties on the side of the British being one marine wounded, and also Mr. Creelman, a settler. The *Challenger* left Rewa for the New Hebrides, orders being given by the commodore that her Majesty's ship *Charybdis*, on arrival from Sydney, should cruise about the group. It is presumed the resident British consul will direct her movements.

It is reported that the great dock at Kowlong was opened on the 15th of August last.

A Vessel Wrecked by an Iceberg in the Atlantic.—By the arrival at Liverpool of the Inman Company's royal mail steamer *City of Boston*, we learn of the abandonment of the ship *Wabeno* in mid-Atlantic. The *Wabeno* was bound from North America to Liverpool, with a cargo of deals; and previous to the 5th instant was struck by an enormous iceberg, which completely disabled the vessel and rendered her unmanageable. On the 5th, the *City of Boston* hove in sight, and seeing signals of distress flying from the *Wabeno*, at once bore down and rescued the captain, crew, and the passengers. The *Wabeno* was in such a crippled state that she could not long keep afloat.—*Daily News.*

This is a *cool* way of accounting for the loss of a ship. However, the question really is, did the iceberg run against the ship, or did the ship run against the iceberg? and considering that they were both navigating the ocean, should the ship have made way for the iceberg, or should the iceberg have made way for the ship? These are nice knotty points for lawyers, but Jack would make short work of them, although as they were both from the westward there might be some difficulty.

The following has appeared in the prints of the day.—It is announced that the United States government intends to send another expedition to the North Pole.

A very practical way of keeping the anniversary of Trafalgar has been observed at Parsontown, a quiet country town in the province of Munster. It appears that Captain George Garvey, R.N., who resides in that neighbourhood, persuaded his friends and neighbours to give effect to their sympathies for sailors by endeavouring to supply some of their wants; and to this end he prevailed upon the ladies to get up a bazaar for the benefit of seamen and marines, to be opened on Trafalgar Day. The design appears to have been well carried out, affording general amusement and realizing the sum of £66, after paying all the expenses. This is all the more creditable that Parsontown has no connection whatever with the navy, and the place is small and comparatively poor—the difficulty being enhanced by the fact, announced beforehand, that the proceeds would be given to the Royal Naval Scripture Readers' Society, an object which would necessarily fail to obtain the support of the Roman Catholics, who form the largest section of the population. Much credit is due to Captain Garvey and the ladies for inaugurating such a practical mode of observing Trafalgar Day, a mode which we commend to the consideration of all who have the time to work for, and the heart to feel for, our seamen and marines.

Why don't the managers of that new Belvedere institution follow the example in all parts of England and Scotland and Ireland?

The late Collision at the Nore.—The Marine Department of the Board of Trade have ordered an inquiry to be instituted, under the powers contained in the Merchant Shipping Act, into the circumstances attending the recent collision near the Nore, between the ship *Leichhart*, for New Zealand, and the *North Star* steam ship, for Christiansand, which resulted in the foundering of the former vessel. The investigation has taken place at Greenwich police court, before the magistrate and the nautical assessors, and resulted in the captain and mate of the steam ship losing their certificates.

Lighthouse of Tahiti.—The new lighthouse at Tahiti was lighted for the first time on the 1st of January, 1868. It is located on Point Venus, on the northern side of Tahiti, and eighty-one feet above the sea level. It is a fixed white light, dioptric lens of the third order, and can be seen on a clear night at a distance of fifteen miles. The tower is square, of masonry, and painted white. This light is in latitude 17° 29′ 48″ south.—*Panama Star.*

Voyage of the Galatea:—The following extract from the *Hants. Telegraph* does not convey a very exalted idea of the style in which the narrative of the *Galatea's* cruise is written. Although we have not seen the work in question, it is impossible not to regret that such a passage should be found in such a work.

In the recently published "Cruise of H.M.S. *Galatea*," by the Rev. John Milner, chaplain, and Oswald M. Brierly, there occurs a singular example of serio-comic pathos. A marine dying of fever, the chaplain observes: "Misfortunes never come single, for next day my poor jacko, the monkey, fell overboard and was drowned; and during the night the ward-room cook died." Darwin and Du Chaillu! (exclaims the *Daily News*) Men and apes! Liberty, Fraternity, and equality! One cannot help smiling, in spite of the melancholy fate he shared with the marine and the cook, at jacko's transfer-sheet, wherein he is described in religion as a ritualist, in rank as "cook's chum;" his possessions are "razors, and Vivian's Bible (thrown overboard), pomatum, tooth-brushes, and commander's comb (swallowed); and he himself" discharged from H.M.S. *Victoria and Albert* to H.M.S. *Galatea*, by order of H.S.H. the Prince of Leiningen.

The *Army and Navy Gazette* says:—How true! Our "wooden walls," once the delight and pride not only of our sailors, but of England, are rapidly and surely passing away. The *Agamemnon*, that graceful among graceful ships; the *Queen*, once looked upon as the finest threedecker afloat; the *Illustrious*, with many a fond and kindly West India recollection clinging to her old timber; and the *Sutlej*, that type of what a fine frigate should be, are all to be brought under that remorseless little instrument—the auctioneer's hammer.

Blessings of our Merchant Service.—It would seem that in some ships of our boasted Merchant Service, the maxim that "might makes

right," occasionally prevails. And it is the recurrence now and then about bullies and "knuckle dusters," that distinguishes the laws which some sail under, in contradistinction to those wherein harmony and kind feelings between officers and men prevail. We shall be curious to see the result of the investigation desired by the captain, whose son is charged with causing the death of a midshipman. There is something in being the captain's son in a ship.

Alleged Manslaughter of a Midshipman.—Yesterday at the Stratford police court, Mr. William Edward Broadfoot, second officer of the ship *Mofussilite*, lying in the Victoria Docks, was charged with feloniously wounding and causing the death of Charles James Dryhurst, a midshipman on board the above vessel. Mr. Lewis appeared on behalf of the relatives of the deceased, who had, he said died under circumstances that demanded investigation. The prisoner was the son of the captain of the ship, and the deceased at the time of his death was nineteen years of age. It seemed that something had passed which had excited the ire of the prisoner, who told the deceased that he would have an account to settle with him on the following day. On the 23rd June, when the ship was near Calcutta, the prisoner struck the deceased a violent blow on the head, which was seriously cut, and blood flowed. The deceased, who previously had very good health, was compelled to take to his berth, and his provisions were reduced. The young man gradually got weaker, and on the ship arriving at Calcutta he was removed to the hospital, where he died of typhoid fever brought on by the injuries he had sustained and his very low state. Several of the seamen then deposed to seeing the prisoner violently assault the deceased. The first blow threw the deceased flat on the hencoop, and he called out, "Don't, sir; don't sir." The prisoner struck the deceased more than once, and the wounds on his head appeared as if they had been inflicted by some instrument, but the prisoner was not seen to have "knuckle dusters" on his hand. The deceased was in the act of putting on his coat when he was struck, and the prisoner had been heard to remark that the deceased had better not go home in the ship. They stopped part of his food when he was in his berth, and he gradually got worse and died in the Calcutta hospital. Captain Broadfoot, the master of the ship, asked for a remand, in order that his son might have legal advice. He was desirous that there should be the fullest investigation. The ship had been employed in the Abyssinian expedition, and had troops on board. He had been many years at sea and had never had a complaint of this kind before. The magistrate remanded the accused for a week, and intimated that they would allow him to put in substantial bail to appear on the day named for his re-examination.

Heroic Conduct of a Seaman.—On Monday, October 12th, the China tea clipper *La Loo*, Captain Smith, bound to Shanghai, was in the East India Dock and preparing to weigh anchor, when one of the seamen, named George Patterson, who was previously noticed to be

under the influence of drink, was missed from the deck. A mess-mate, named William Hodge, at once instituted a search, and fearing that he had fallen overboard looked over the side of the ship, and saw the missing man come to the surface and suddenly sink with his head downwards. Without waiting to divest himself of his clothing, Hodge jumped over the side of the vessel, but the right leg of his trousers catching in a bolt, he was swung with considerable violence against the side of the ship. He struggled to extricate himself, and although in great pain, by a sudden jerk he tore the trousers leg and dived after the drowning man, whom he brought to the surface, and was ultimately taken on board. The ship proceeded to sea, Hodge in the meantime complaining of his injuries; and fearing that his hip and some of his ribs were broken, the captain deemed it expedient to land him with the pilot. To this Hodge assenting, he was brought ashore in one of the Cowes pilot boats, and was on Saturday received into the Hospital at Landport. He is now progressing favourably. We hope that the attention of the authorities will be directed to this case, because from the fact of the man having lost his ship, and being destitute of the means of conveying him, upon recovery, to his home at Liverpool, his conduct is deserving of some special consideration.

Tidal Currents in the Gulf of Cambay.

There is a dangerous rushing tide, called the Bore, in the Gulf of Cambay, which navigators going to the northward of Perim island should be on their guard against.

The tides throughout the gulf are extremely rapid, and the rise and fall great. The whole shore bordering on the sea is low, and overflowed for some distance inland at high springs, being intersected by numerous small creeks and ravines.

The Bore is a rapidly flowing tide-wave forced through a narrow passage, over the remains of the ebb tide, the counter-action of which helps to give the wall-like aspect of the Bore.

Below Gongwa on the east side of the gulf, and Dhólera on the other there is no bore; but to the northward of these places there are two, of which ships must beware.

The eastern or principal Bore rises to the eastward of the Bore Rocks, about eleven miles south-west of Cambay town, and is not perceptible on the neap tides, unless the previous springs have been very high, when it may be noticed slightly through the quarter. When the springs begin to lift it plainly shows itself, increasing in height and velocity till two days after new or full moon, when it declines.

When new moon coincides with *perigee*, and the full moon with *apogee*, the highest tides are said to occur. The Bore varies with the night and day tide, the former being six to eight feet higher than the

latter between September and April, and as the flood stream of both night and day runs for the same length of time, about three hours, the highest or the night tide in the fine season, and day tide in the rainy season, must have the greatest velocity.

In January, 1837, at very high springs in Cambay creek, about five miles W.S.W. of the town, the Bore was observed six feet high, advancing at the rate of ten knots per hour, with a loud noise, between the steep cliffs on the north and the sand-bank on the south, in a passage about five hundred yards broad. A quarter of an hour after the Bore wave had passed the stream was found running at the rate of four and a half knots only; but three quarters of an hour after its passage, the flood stream attained the velocity of eight knots, afterwards gradually declining; the ebb stream beginning three hours after the passage of the Bore wave.

The rise of the night tide in those three hours of flood was thirty-one feet, and the rate of its rise was as follows:—In the first ten minutes of flood tide the water rose six feet; in the first hour eighteen and a half feet, in the second hour eight and a half feet, and in the third hour only four feet.

From the above position where these facts are noted, the Bore rushed onwards to within three miles of Cambay; then deflected by a sand-bank, the principal stream turned over to south-east towards Kévi bunder, and thence north-eastward to Dawan, on the Mhye river; the lesser stream moving on past Cambay town, and losing itself over the banks.

The day tide at the above position only rose twenty-three feet. The ebb tides run steady, but do not acquire their greatest velocity, which is about seven knots, until more than half-tide, when the high banks are uncovered, and the stream is confined to its narrow channel.

Off the village of Dawan, on January 10th, 1837, the Bore was observed seven feet high, with an initial velocity of ten knots; but after the wave's passage, the speed was reduced to five knots, increasing again to seven knots three-quarters of an hour afterwards, when it gradually got weaker till the ebb made.

The Western Bore, which runs up Sábermati, is very similar to the other, but of less elevation and force; but both tend to cut away the banks and form new ones, so altering the channels as to render their navigation by strangers an enterprise not to be attempted. On the west bank of the Sábermati, between Amli creek and East cape, the surveyors in 1837 found that a strip of bank, of a breadth from 700 to 1,300 yards, throughout a length of five miles, had disappeared in one year.

The above description of the Bore shows that the flood tide comes with a sudden burst at great velocity; then, decreasing in strength for a time, attains its full strength about three-quarters of an hour after the passage of the bore-wave. The stream afterwards never attains the same velocity as the wave of the Bore.

Tonnage of British ships in ports of the United States.

The Board of Trade have received, through the Secretary of State for Foreign Affairs, the following copy of a circular which has been issued by the Treasury Department of the United States with reference to the exemption of British vessels from Tonnage Admeasurement in ports of the United States. Thomas Gray, Assistant Secretary.

Board of Trade, Marine Department, Oct. 2nd, 1868.

"Treasury Department, Sept. 9th, 1868.

"By recent Order in Council the British Government has directed 'that the Merchant ships of the United States of America, the measurement whereof shall, after the 1st of January, 1865, have been ascertained and denoted in the registers and other national papers of such ships, testified by the dates thereof,' shall be deemed to be of the tonnage denoted in such registers, or other national papers, in the same manner and to the same extent and for the same purpose into and for which the tonnage denoted in the certificate of registry of British ships is deemed to be the tonnage of such ships, after making therefrom the same deductions in respect of crew space and engine-room as would, if such ships were British, be made from their gross tonnage under the laws relating to British ships.

"It is proper that similar courtesy should be extended, so far as possible, to British vessels in Ports of the United States. It is accordingly directed that British vessels whose registers indicate their tonnage under the present British law, shall be taken in Ports of the United States to be of the tonnage so expressed in their documents, with addition of the amount of deductions made under the British law, not authorised by the admeasurement law of the United States.

"Usually the gross tonnage may be ascertained from the register. In such cases the vessel will be entirely exempt from admeasurement.

"If the gross tonnage is not indicated by the register, it may be necessary to measure the spaces appropriated to the crew, and to engines below the upper deck, whose capacity has been deducted under the British law; but admeasurement will be made only when, and to such an extent as, absolutely necessary. Fees will be charged only for the services rendered, and no more.

"Officers will remember that spaces appropriated to engines above the upper deck to the hull are, by the United States law, as well as by the British, exempt from admeasurement for tonnage.

"H. M'Culloch, Secretary of the Treasury."

New Books.

The Sailor's Hornbook *for the Law of Storms, etc., etc. By H. Piddington. Williams and Norgate, London.*

A fifth edition of this important "Hornbook" in 1868, from a second in 1862, may be taken as a fair proof of the important place which it holds in the estimation of seamen. Indeed they have good

reason to be thankful to the author of the work before us (now we believe no more) for taking the initiative from Redfield (gone also to his rest), and gathering in the eastern world similar materials as he had done in the west. The present edition is enlarged by about a hundred pages of fresh matter, and we trust this will never be exceeded, for a subject like this important enough in its own way should not be allowed to attain inconvenient proportions,—for after all the fact that it is but secondary should not be forgotten. The patience and attention of the seaman must not be wearied by bulky volumes on subjects, the whole of which as we have said long ago lies in a nutshell. We cannot compliment the present author on the clearness of some of his illustrations, for instance, the first chart (from our volume for 1836, page 208) communicated to this work by Redfield himself, shews the weight of years of hard work—blurred, and is not in keeping with others. A new edition of a work of this kind is intended for new hands, and need not displace any former one. The seaman who has the subject by heart (and who is he that has not in these days) will be satisfied with the new matter, resulting from his own experience rather than in looking for it here. But to the officer who is new we say get it—for it is indispensable.

NAVIGATION AND NAUTICAL ASTRONOMY; *Practical, Theoretical, Scientific, for the use of Students and Practical men. By J. Merrifield, F.R.A.S., etc., and H. Evers, of Plymouth, author of Navigation and Great Circle Sailing, etc. Longman's, London*, 1868.

A new treatise on navigation in these advanced times when discovery has left but little to be discovered, even for the practical man, and when intended also especially for the use of the student, should be in every possible sense clear, intelligent, concise, and *au courant* with the latest and most improved methods of solving all its problems. These desiderata it may be fairly said will be found in the work before us.

There is no occasion for us to stop with the enquiry are there not works enough of this kind—or why add another to them? the director of a school chooses his own course for his pupils to pursue and not finding a work to his mind frames his own. It is but a few months ago we had a treatise on navigation of another school, but with different aims and therefore a different method. Let us look into this of the Plymouth school.

Works on navigation of former days generally set out with geometrical axioms, the relation of lines and angles, but we come at once here to nautical astronomy and its relations to navigation. Although there can be no doubt that a good foundation in geometry is essential to other branches of science, it has therefore a right to be provided beforehand for the future navigator. A youth so provided to which the resources of arithmetic are added, and capable of stating a proportion where the required quantity has its proper place in it, enters here at once into the mazes of navigation,

and is introduced to meanings of difference of latitude and longitude, the mysteries of the compass, courses, leeway, logline and glass, and the different sailings. Thus a youth is led on to the ship's day's work, and then for determining the position recourse is had to nautical astronomy for the correction of the dead reckoning, from which the supposed position at noon is deduced. The foregoing subjects occupy about a third of the work before us, and are treated with fulness and clearness, enabling the student to make progress if he retains what he reads, without as the authors say requiring a reference to other books, doubtless a great advantage to which this work lays claim. A judicious set of examples as questions concludes each of the subjects comprised in this first part, which is terminated by great circle sailing.

We must reserve our further remarks on the second part which treats on nautical astronomy for another number.

MANUEL DE LA NAVEGACION DEL RIO DE LA PLATA; *y de sus principales afluentas. Por los Senores Lobo y Riudavets, Madrid.*

We take the opportunity of noting the appearance of the second edition of this work of some three hundred pages accompanied by a neatly executed chart extending up to Buenos Ayres and the Parana and Uruguay. We shall avail ourselves in some future numbers of a translation of some of its information that will be useful to seamen, concerning a navigation which is every day growing in importance. And we counsel our purveyors of this kind of matter to enrich their stores by a translation of the new matter which it contains, for it must render imperfect the best they have yet published on the navigation of the River Plata.

PILOT CHARTS FOR THE ATLANTIC OCEAN.

A set of four charts of the North and South Atlantic is just published by the Admiralty Hydrographer, that conveys to the seaman an amount of information concerning its pilotage, for which he will be most grateful. They make a nearer approach to the perfection for which they are meant than anything we have yet seen of that most comprehensive class included in their name of "Pilot Charts." And they do this in the clearest and most intelligent way possible, imparting their information to the seaman at every step (we had almost said), or perhaps day of his progress, without crowding it into confusion. For this the seaman will be thankful, and will soon make himself master of the design proposed by them. The number of four in the series will immediately suggest their application to each season of the year, and their piloting character will be at once taken as referring to those all important particulars which affect a ship's passage, viz.: Wind and Weather. These, of themselves we might say, almost form the main source of a good passage, and such charts as these, enriched as they are with maxims of such information, creeping everywhere about the coasts as they do, with the zeroes proportionate to the amount of calms as well as arrows indicating by their different lengths and directions, the most probable winds as well as their strength on

"the high seas," will go far to initiate the mind of the seaman into such detail, and while making him observant of these matters and familiar with the mode of expressing them, will at the same time tend to elevate his character, and must improve him in his position.

A note prefixed to these charts informs the seaman as to the authorities on which they are formed, and at the head of which stands Captain Maury. We are very glad to perceive by it that similar kind of information concerning the Indian and Pacific Oceans is preparing also for simliar publication.

TIDE-TABLES FOR THE BRITISH AND IRISH PORTS *for the year* 1869. *Published by order of the Lords Commissioners of the Admiralty. Potter, Poultry, London.*

Verily the compilers of our tide-tables at what are called the out ports owe a large debt of gratitude to our naval authorities at the Admiralty, for this annual present, which generally appears about a couple of months ere the term of the expiring year is concluded. Time was when such was not the case, and tide-table makers had to wander about without finding one cut and dried to their hands, and this too on authority. Tables such as these we insist are a great boon to them, furnishing them as they do with constant quantities for application to the great port nearest to them at which the tide time and rise is daily given, and from which application their own is at once obtained. Such we say is a great advantage, yet not more so than should be afforded by a provident government of the first maritime country of the old world. But if they are a credit to the high office which contributes, as they certainly are, they also reflect honour on the unwearied head and hands which have to go through the large uninteresting mass of figures with which they are produced by the computations of Staff-Commander Burdwood, R.N.

TO CORRESPONDENTS.

The following received, and in our next. "Quod verum tutum." Also, The ship *Isabella Brown.*

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, *in November*, 1868.—*Sold by the Agent, J. D. Potter*, 31, *Poultry, and* 11, *King Street, Tower Hill, London.*

157 DEm = 0·27. Italy, West Coast, San Romo to Cavallo Cape, with 4 plans, French Survey, 1868. 2s. 6d.

165 DEd = 6·3. Mediterranean, Sardinia Island to Malta, including Sicily island, *various*, 1868. 2s. 6d.

311 $\frac{DE}{2}$ m = *various*, Celebes anchorages, Lobie, Kalie susu or Dwaal bays, Gorontalo river, and Tello Moton harbour, various, 1868. 1s.

EDWARD DUNSTERVILLE, *Commander, R.N.*
Admiralty, Hydrographic Office, 18*th November*, 1868.

INDEX.

LIGHTS.

J. Martin, Printer, 9, Lisson Grove, N.W.

PRESERVATION OF SHIPS' BOTTOMS FROM FOULING IN ANY PART OF THE WORLD, AT A SMALL COST.

THE **Number 1** COMPOSITION (light green) is admirably adapted for preserving copper or yellow metal sheathing from waste; making it last three times as long by giving an annual coating; and returning a much greater percentage of old metal than if left to its ordinary wear without coating.

THE **Number 2** ANTIFOULING COMPOSITION (pink) *contains no copper*, and is prepared exclusively for the bottoms of **Iron Ships** protecting the plates and rivets from corrosion or galvanic action, and from ordinary *fouling*; also giving additional speed, as shortly after immersion the surface becomes slimy *like the back of a fish.*

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The **Number Four** Composition (copper colour) is prepared for single bottomed vessels, ships' bends, the bottoms of lighters, barges, droghers, and boats; protecting them from worm and fouling; also for preserving railway sleepers, telegraph posts, gate posts, &c., from white ant and decay *(see pages 52 to 62).*

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Shipowners are now alive to the importance of avoiding PREPARATIONS OF COPPER, after the fearful destruction recently evinced by galvanic action on the plates and rivets of many iron and composite ships (*see pages 1 to 16 and appendix*).

N.B.—It is about the same price as red lead, mixed for use, taking into consideration the difference of quantity required, weight for weight. It may be laid on over ANY *ordinary paint used for a priming coat or coats*, but red lead is recommended as the best priming under water for the No. 2, ANTI-FOULING Composition.

The **British Admiralty** are now using Messrs. Peacock and Buchan's *economical* Composition on *many* of the Iron Ships of the Royal Navy, and the reports are very favourable in comparison with the numerous applications their Lordships are patriotically and periodically trying from other inventors: most of whom use *copper* or *mercury* as a base, and are *very expensive*, without any comparative advantage.

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PEACOCK AND BUCHAN'S No. 3 COMPOSITION PAINT.

CERTIFICATES.

From Lieut. F. B. Renshaw, R.N., H.M. Turret Ship "Wyvern."

Messrs. Peacock and Buchan. H.M. Ship *Wyvern*, Holyhead, 11th Jan., 1868.

Gentlemen,—Your No. 3 Composition paint has been used on board H.M. turret ship *Wyvern* for upwards of two years; it has answered extremely well on our iron bulwarks, spars, and in every part where put on. The day before the Naval Review we painted the outside with your black during squally and wet weather; it dried in a couple of hours quite hard with a beautiful gloss.

Having been First Lieutenant of the *Wyvern* for two years, and tried it well, I shall always recommend it for its *economy*, being conveniently packed in tins and always ready for use without mixing, it washes, and looks well.

I am, yours, etc.,

(Signed) F. B. RENSHAW, Lieut. R.N.

P.S.—Captain Burgoyne, V.C., has often said that he never saw paint to equal it.

From Messrs. John Holman and Sons, Topsham Clubs.

Messrs. Peacock and Buchan. Topsham, 9th January, 1868.

Dear Sirs,—We have much pleasure in giving you our opinion of your excellent No. 3 Composition Paint. We have used it for many years on all our ships, and also on our houses in this place. We find there is considerably less waste and trouble with it; it goes farther and stands much longer than ordinary paint. For ships' *sea stores*, being mixed for use, and keeping well in all climates, we think it is one of the best ideas ever heard of—so handy in form—having large or small quantities ready prepared, and the small space it occupies; freedom from all risk of fire, there being no oil and spirits of turpentine packages knocking about at sea, to the danger of leakage, damage to goods, etc., all of which is avoided by taking your *mixed paint*; and to our mind these advantages are so recommendatory that they need only be named to ship-owners to ensure their adoption. We have just sent off a considerable quantity to our largest ship, the *Sea King*, going to Australia from Liverpool with passengers, and also to the *England's Rose*, in London, bound to the Cape of Good Hope. You can make any use of this communication you please. We are, dear Sirs, yours obediently,

JOHN HOLMAN AND SONS.

P.S.—We have just heard that Haldon House, the seat of Sir Lawrence Palk, M.P., is being painted with it.

From Captain H. T. Burgoyne, R.N., V.C. of H.M. Iron Turret Ship Wyvern.

Her Majesty's Ship *Wyvern*,

Messrs. Peacock and Buchan. Portsmouth, August 14th, 1867.

Sirs,—I have much pleasure in bearing testimony to the merits of your Paint, which has been used on this ship for the last year on our weather works, which are of iron. It has proved most satisfactory in every way, particularly the black, which on one occasion was put on the iron bulwarks and dried in a couple of hours with a good gloss, notwithstanding a heavy shower of rain.

The white and buff are equally good, and scarcely affected by the salt water.

Your obedient Servant,

(Signed) H. T. BURGOYNE, Captain, R.N.

From J. Hodge, Esq., Ship-owner, St. Ives.

St. Ives, 23rd September, 1867.

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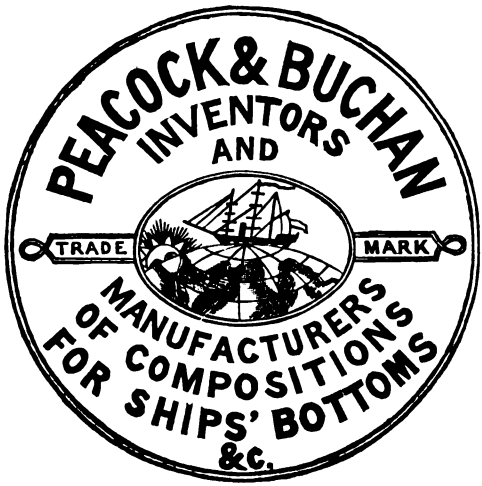

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St. Ives, 23rd September, 1867.

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Binnacle Compass corrected for Deviation, by A. B. Becher, Captain, R.N., F.R.G.S.	1	0
Storm Compass: or Seaman's Hurricane Companion, by do. ...	1	6
Mast Head Angles, by ditto	2	0
Ex-meridian Altitude Tables, by J. T. Towson	1	0
Sun's True Bearing, or Azimuth Tables, computed for Intervals of Four Minutes, between the Parallels of Lat. 30° and 60° inclusive, by John Burdwood, Staff-Commander, R. N.	4	6
Occultation Tables, by Capt. Shadwell, R.N., C.B....	4	6
Star Tables, ditto	2	6
Chronometer Tables, ditto	4	6
Lunar Tables, ditto	4	6
Formulæ of Nautical Astronomy, ditto	2	6
Finding the Longitude simultaneously with the Latitude at Noon, by A. C. Johnson, R.N.	1	0
The Law of Port Helm, by Comms. Columb and Brent, R.N. ...	2	6
Seamanship, by Commander G. S. Nares, R.N.	21	0
Astronomical Register, published monthly	1	0
Golden Hints to Young Mariners	3	0
Marryatt's Code of Signals	12	0
Piddington's Law of Storms	10	6
Board of Trade Wind Charts, in case	28	0
Lights for the World ... ... 6d. to	1	6
Tide Tables for the Current Year	1	6
Field's Parallel Rule	8	0
Sole Manufacturer of Toynbee's Rule	25	0

Barometers, Sextants, Compasses, and all kinds of Nautical Instruments Manufactured and Repaired.

The above Admiralty Charts and Books can be had of the following Sub-Agents:

Stamford, E., Charing Cross
Edwards, Custom House, Liverpool
Jewitt & Co., South Castle st., ditto
Appleby, R. C., Custom House, Hull
Cole, Hugh, Queenstown, Ireland
Feathers, P., Dundee
Hill & Price, Broad Quay, Bristol
Hodges and Smith, 104, Grafton Street, Dublin
M'Gregor & Co., 38, Clyde Place, Glasgow
M'Gregor & Co., Cathcart Street, Greenock
Lackland, J., South Shields
Moore, F. M., High Street, Belfast, and Dublin
Reid & Co., High St., Sunderland
Stiles & Saunders, ditto
Reid & Son, 36, Shore, Leith
Stebbing, Canute Rd., Southampton
Williams, E., Bute Docks, Cardiff
Cail, S. A., 24, Quay Side Newcastle-on-Tyne
Dobbie, A., 24, Clyde Pl., Glasgow
Dodds, M. S., 34, Quayside, Newcastle-on-Tyne

NAVAL INTELLIGENCE.

COMPETITIVE TRIAL

OF

Anti-Fouling Compositions.

From the "Exeter and Plymouth Gazette," of Friday, October 23rd, 1868.

INTERESTING EXPERIMENT AT H.M.'s DOCKYARD, DEVONPORT.—H.M.'s iron ships, *Warrior* and *Defence*, were taken into dry dock at Keyham a few days since to examine their bottoms, in order to test the economical merits of two rival compositions for protecting the plates and rivets and preventing fouling. We understand that the more economical composition of Messrs. Peacock and Buchan had been on the bottom of the *Defence* about twelve months, whilst the copper preparation of Mr. Hay, called the maritime improvement, had only been on the *Warrior* some seven months. The surface of the *Warrior's* bottom was studded with gooseneck barnacles of large size, whilst that of the *Defence* was free from them, although the two ships had been cruising in company, and the *Defence* about five months longer afloat. This extraordinary result is looked upon as very satisfactory for the future economy of dockyard expenditure in this respect; but another trial will be made before deciding which composition will in future be adopted in the navy. No less than thirty-one other descriptions of compositions have been tried on different ships, and the final trial would appear to be between the two above-named competitors. The *Morning Advertiser*, of the 16th instant, says:—Messrs. Peacock and Buchan, the well-known inventors and manufacturers of this successful composition, have been awarded a silver and a bronze medallion by the jurors of the Royal Havre Exhibition.

From the "Western Morning News," of Thursday, October 22nd, 1868.

The *Warrior* and *Defence*, ironclads, were docked last week alongside of each other in two adjoining dry docks at Keyham, for the purpose of comparing the state of their bottoms respectively, these iron ships having been coated with rival compositions, the former with Hay's preparation and the other with Peacock and Buchan's. We understand that the *Warrior* was very foul after seven months' trial, and the *Defence* very clean after twelvemonths' trial. They are again being coated with the same compositions as before for a further trial. We extract the following from the *Morning Post*, of the 16th instant:—Messrs. Peacock and Buchan, the well-known inventors and manufacturers of successful compositions for ships' bottoms, have been awarded a silver and bronze medallion by the jurors of the Royal Havre Exhibition. The prizes will be distributed by the Empress Eugenie on October 26th.

QUEEN ADELAIDE NAVAL FUND,

(ESTABLISHED 1850,)

FOR THE RELIEF

OF THE

ORPHAN DAUGHTERS OF OFFICERS

IN THE

Royal Navy and the Royal Marines.

Plan of Work in the application of the Fund.

The working expenses (which are very small, as there are neither salaried officers nor hired rooms) are paid out of the Donations, and the balance is invested from time to time in the Public Funds. The Dividends arising therefrom, and the Annual Subscriptions *are entirely appropriated to the relief of the* ORPHAN DAUGHTERS *of Naval and Marine Officers* by pecuniary grants to them, bestowed at the discretion of the Committee, either for the education of the young, the maintenance of the aged, or the casual assistance of those who are in temporary difficulty. The circumstances of most of the applicants are *personally investigated* by members of the Ladies' Committee, so that Candidates are spared the expense of a tedious and perhaps useless canvass, and the Subscribers have thus a guarantee for the proper disposal of their Contributions.

A Few of the Cases Relieved from the Fund are here repeated from the last Report of the Committee for 1868.

No. 1. 15.—* * *, two daughters of a Lieutenant, R.N., aged respectively 58 and 56. Mother dead. One sister married, unable to assist them. Incapacitated from extreme ill-health to do anything for their own support.

No. 1. 57.—* * *, aged 68, daughter of a Captain, R.M.L.I., who died in 1844, after 60 years' service. Mother dead. Only income, £12 a year from the Compassionate Fund. Prevented by bodily infirmities, and the loss of a leg, from gaining a livelihood.

No. 2. 9.—* * *, aged 64, daughter of a Master, who died in 1837. Only income £17 a year. Unable to maintain herself.

No. 2. 10.—* * *, aged 68, daughter of a Commander, R.N., who died in 1846. Income £14 from Compassionate Fund. Unable from illness to support herself.

No. 2. 15.—* * *, aged 62, daughter of a Commander, R.N., who died in 1859. Has no relatives, sole source of income being £14 from the Compassionate Fund. Carried on a small school, but has been obliged to relinquish it from illness.

No. 2. 28.—* * *, aged 50, daughter of a Paymaster, R.N., who distinguished himself in the French wars, and died in 1820. Mother dead. Total income, £10 from Compassionate Fund. Unable to maintain herself in consequence of disease of the spine.

☞ *The Committee desire that it may be understood that these cases are but a sample of the whole. Stronger cases might be quoted, but are omitted from motives which cannot but be appreciated.*

Many of the applicants for relief would be thankful for employment as Governesses or Companions, some as Needlewomen or otherwise; and to many more left-off clothes would be very acceptable. The Ladies of the Committee are generally able to point out some such cases to friends willing to give assistance. Mrs. Skyring (Admiralty, Somerset House) has kindly consented to continue to receive contributions.

The fact should be known that 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 from the very limited means at its disposal; and they receive the all but stereotyped reply of regret that want of funds prevents the Society from affording them relief.

THE COMMITTEE EARNESTLY ASKS FOR CONTRIBUTIONS

IN AID OF THIS

QUEEN ADELAIDE NAVAL FUND,

AND STATE THAT THEY

WILL BE THANKFULLY RECEIVED BY

THOMAS STILWELL, Esq., Arundel Street, Strand. *Treasurer.*
The Rev. E. S. PHELPS, H.M. Dockyard, Portsmouth.
ARTHUR ELLIS, Esq., R.N., 32, Sackville Street, Piccadilly.
FREDERICK J. BOWDEN, Esq., Admiralty, Somerset House. *Hon. Sec.*
Messrs. CASHER, Portsmouth.
Mr. OLIVER, Devonport.

AND BY ALL THE NAVY AGENTS.

Royal National Life-Boat Institution.

Supported by Voluntary Contributions.

Patroness — HER MOST GRACIOUS MAJESTY THE QUEEN.

Vice-Patron—His Royal Highness the Prince of Wales, K.G.

President—His Grace the Duke of Northumberland, P.C.

Chairman—Thomas Baring, Esq., M.P., F.R.S., *V.P.* *Deputy-Chairman*—Thomas Chapman, Esq., F.R.S., *V.P.*

Secretary—Richard Lewis, of the Inner Temple, Esq., Barrister-at-Law.

Life-boat Inspector—Capt. J. R. Ward, R.N. *Assistant Life-boat Inspector*—Capt. D. Robertson, R.N.

APPEAL.

The Committee of Management have to state that, during the past year (1867), and the first nine months of the present year, the Royal National Life-boat Institution has expended £46,184 on various Life-boat Establishments on the Coasts of England, Scotland, and Ireland, in addition to having contributed to the saving of 1,664 persons from various Shipwrecks on our Coasts. Every winter that comes and goes has its black record of wrecks, and its terrible list of lost lives. How many would have been ready this winter to give all the wealth they possessed to behold a Life-boat putting off to their stranded vessel. Perhaps it was the first time that some of them had ever seriously thought of a Life-boat, and it was too late.

General Summary of the Work of the Institution during 1867 and 1868 (to 30th Sept.)

			£.	s.	d.
Number of Lives rescued by Life-boats, in addition to 53 Vessels saved by them	..	1,128		..	
Number of Lives saved by Shore-boats, &c.	..	536		..	
Amount of Pecuniary Rewards for Saving Life	..	..	4,763	2	6
Honorary Rewards:—Gold and Silver Medals	20	..		..	
Votes of Thanks on Vellum and Parchment	22	..		..	
Total	42	1,664	4,763	2	6

The Committee desire to acknowledge with gratitude the liberal support which they have received from the British Public during the past few years,—a support which has enabled them to establish their present great Fleet of 189 Life-boats on the shores of the United Kingdom. Deeply sensible, however, of the great responsibility that rests on them to maintain their Fleet in a thoroughly efficient state, and its crews practised in the management of their boats, which can only be effected by a large and *Permanent Annual Income*, they earnestly appeal to all classes of their countrymen to continue to aid them in upholding and perpetuating so great and truly national a work.

The number of Lives saved either by the Life-boats of the Society, or by special exertions, for which it has granted Rewards, since its formation, is 17,565; for which services 90 Gold Medals, 786 Silver Medals, and £28,283 in cash have been paid in Rewards. The Institution has also expended £208,347 on its One hundred and Eighty-nine Life-boat Establishments.

The expense of a Life-boat, its Equipment, transporting-carriage, and boat-house, averages £640, in addition to £50 a-year needed to keep the station in a state of efficiency.

Donations and *Annual Subscriptions* are earnestly solicited, and will be thankfully received by the Bankers of the Institution, Messrs. Willis, Percival, and Co., 76 Lombard Street; Messrs. Coutts and Co., 59 Strand; Messrs. Herries, Farquhar, and Co., 16 St. James's Street, London; by all other Bankers in the United Kingdom; and by the Secretary, Richard Lewis, Esq., at the Office of the Institution, 14 John Street, Adelphi, London, W.C.—1*st October* 1868.

Royal National Life-Boat Institution.

(INCORPORATED BY ROYAL CHARTER.)

Supported by Voluntary Contributions.

LIST OF THE LIFE-BOAT STATIONS OF THE INSTITUTION.

ENGLAND.

Northumberland—
1 Berwick-on-Tweed.
Holy Island, No. 1.
" No. 2.
North Sunderland.
5 Boulmer.
Amouth.
Hauxley.
Newbiggin.
Blyth, No. 1.
10 " No. 2.
Cullercoats.
Tynemouth—No. 1.
" No. 2.
Durham . . . Whitburn.
15 Sunderland.
Seaton Carew.
Yorkshire . . Middlesborough.
Redcar.
Saltburn.
20 Runswick.
Whitby.
Upgang.
Scarborough.
Filey.
25 Bridlington.
Hornsea.
Withernsea.
Lincoln . . . Cleethorpes.
Donna Nook.
30 Theddlethorpe.
Sutton.
Skegness.
Norfolk . . . Hunstanton.
Blakeney.
35 Sheringham.
Cromer.
Mundesley.
Bacton.
Hasborough.
40 Palling.
Winterton.
Caister, No. 1.
" No. 2.
Yarmouth, No. 1.
45 " No. 2.
Suffolk . . . Gorlestone.
Lowestoft.
Pakefield.
Kessingland.
50 Southwold, No. 1.
" No. 2.
Thorpeness.
Aldborough.
Kent . . . Margate.
55 Kingsgate.
Broadstairs.
Ramsgate.
North Deal.
Walmer.
60 Kingsdowne.
Dover.
Sussex . . . Dungeness.
Rye.
Winchelsea.
Sussex . . . 65 Hastings.
Eastbourne.
Newhaven.
Brighton.
Shoreham.
70 Worthing.
Selsey.
West Wittering.
Hampshire . . Hayling Island.
Isle of Wight . Bembridge.
75 Brighstone Grange.
Brooke.
Guernsey . . . St. Samson's.
Dorset . . . . Poole
Chapman's Pool.
80 Weymouth.
Lyme Regis.
South Devon . . Exmouth.
Teignmouth.
Brixham.
85 Plymouth.
Cornwall . . . Looe.
Fowey.
Falmouth.
Cadgwith.
90 Lizard.
Mullion.
Porthleven.
Penzance.
Sennen Cove.
95 St. Ives.
Hayle.
New Quay.
Padstow.
Bude Haven.
North Devon .100 Appledore.
Braunton.
Ilfracombe.
Somerset. . . . Burnham.

WALES.

Glamorganshire . Penarth.
105 Porthcawl.
Swansea. (elly
Carmarthensh. Pembrey & Llan-
Carmarthen Bay.
Pembrokeshire . Tenby.
110 Milford.
Fishguard.
Cardiganshire . Cardigan.
Newquay.
Aberystwith.
Merionethshire 115 Aberdovey.
Barmouth.
Carnarvonsh. . . Portmadoc.
Porthdinllaen.
Anglesey . . . Llanddwyn.
120 Rhoscolyn.
Holyhead.
Cemlyn.
Bull Bay.
Moelfre.
125 Penmon.
Carnarvonshire . Orme's Head.
Flintshire . . . Rhyl (Tubular).
Abergele.

ENGLAND (*continued*).

Cheshire . . New Brighton, No. 1.
130 Do. (Tubular) No. 2.
Lancashire . . . Southport.
Lytham.
Blackpool.
Fleetwood.
135 Piel.
Isle of Man . . . Castletown.
Douglas.
Cumberland . . . Whitehaven.
Maryport.
140 Silloth.

SCOTLAND.

Kirkcudbright . . Kirkcudbright.
Wigton . . . Port Logan.
Ayrshire . . . . Girvan.
Ayr.
145 Irvine.
Argyleshire . . . Southend.
Campbeltown.
Caithness-shire . . Thurso.
Orkney Islands . . Stromness.
Elginshire . . 150 Lossiemouth.
Banffshire . . . Buckie.
Banff.
Aberdeenshire . Fraserburgh.
Peterhead.
155 Stonehaven.
Forfar . . . . Arbroath.
Buddon Ness } Dun-
Broughty Ferry } dee.
Fifeshire . . . . St. Andrew's.
160 Anstruther.
Haddingtonshire . North Berwick.
Dunbar.

IRELAND.

Co. Londonderry . Greencastle.
Antrim . . . Portrush.
Down . . . 165 Groomsport.
Ballywalter.
Tyrella, Dundrum.
. Newcastle, do.
Louth . . . Dundalk.
170 Drogheda.
Dublin . . . Skerries.
Howth.
Poolbeg.
Kingstown.
Wicklow . . 175 Wicklow.
Arklow.
Wexford . . Courtown.
Cahore.
Wexford, No. 1.
180 " No. 2.
Carnsore.
Waterford . . Tramore.
Dungarvan.
Ardmore.
Cork . . . 185 Youghal.
Ballycotton.
Queenstown.
Courtmacsherry
Kerry . . 189 Valentia.

The following are Extracts from the General Rules of Management:—

"Each Life-boat to have a Coxswain Superintendent, with a fixed Annual Salary of £8, and an Assistant Coxswain with a yearly Salary of £2.

"The Life-boat to be regularly taken afloat for exercise once every quarter, fully manned and equipped, so that the Crew may be familiar with her qualities and proper management. On every occasion of exercise, the men are to be paid 5*s.* each in stormy weather and 2*s.* each in fine weather; and on every occasion of going off to a Wreck to save Life, each man of the Crew to receive 10*s.* by day, and £1 by night. These payments to be doubled on occasions either of extraordinary risk or of long exposure.

"The Life-boat to be kept on her Carriage, in the Boat-house, with all her gear in her ready for use. Signals are agreed upon for calling the Life-boat's crew together; and immediately on intimation of a Wreck, or Vessel in distress, the Coxwain is to muster his Crew, who are to put on their Life-belts, launch his Boat, and proceed to her assistance.

"The Local Committee to make quarterly inspection, and Report to the Institution as to the behaviour of the Boat during exercise, pointing out any defect that may be remedied, and offering any suggestion that may conduce to the efficiency of the service.